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CINI INDIA PROJECT

The prevention of children malnutrition as a programme of social development.

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A tutti i bambini di Calcutta.

INDEX

INTRODUCTION

Dr. Samir Chaudhuri

The CINI (Child In Need Institute) is an NGO (non governmental organization) founded in 1974 by Dr. Samir Chaudhuri, pediatrician and nutritionist Calcutta, and is now operating in a number of districts in India. The organization aims to promote education programs, rehabilitation and protection for the Indian population. At its inception, the mission of Dr. Chaudhuri was mainly focussed on programs to assessment, treatment and rehabilitation of SAM (Severe Acute Malnutrition) in children of Calcutta but in time this new, small project received wide acclaim quickly becoming one of the major centers for the support of the local population today; and is backed and supported by an extensive network of local and international organizations including Save the Children, UNICEF, and the Government of India.

I came to know CINI for the first time in 2011 and for the preparation of the thesis I attended the center for two months from August to October 2012. In that time I followed the various aid activities that the center organizes and offers the local population, I visited the centers located in neighboring villages in Kolkata, I carried out research by taking advantage of the many texts and documents stored in the library and last but not least I had the opportunity to observe the work done within the clinic for rehabilitation to nutrition, mainly aimed at the treatment of severe malnutrition in infants and children. During my observation, I have collected through the administration of a questionnaire prepared by the team of nutritionists working there, anthropometric, clinical and socio-economic of the 16 patients admitted to the clinic at the time of my visit.

With this thesis, I propose therefore to provide an overview of CINI's projects and its objectives, its organization and the impact it has on its users. To make the evaluation of the overall project more objective and realistic, I also considered the socio-cultural aspect of the people living in West Bengal and specifically of the East area of Kolkata where the main center (CINI ONE, Poilan) is located. As a dietitian, I focused on the general problem of children malnutrition, that is still a plague in the rapid development of India,

and on the system adopted by CINI to deal with it. The thesis will be organized in the following sections:

The first chapter focuses on explaining the overall CINI's project and its various activities.

The second chapter explains the most important projects of CINI, which I observed during my stay in the centre. The data were taken from the '2010-2011 annual report published in connection with the completion of thirty years of service CINI in Kolkata.

In the third chapter I have tried to give a definition of the concept of malnutrition investigating its probable causes and the negative effects that this condition brings the functionality and structure of the child during the period of growth.

The fourth chapter describes the situation of malnutrition in india as a social problem. To gather this information, I used the third major NFHS survey (National Family Health Survey) published in its latest version of 2005-2006.

In the fifth chapter, I have provided the World Health Organization, WHO (World Health Organization) guidelines of 2006 as a reference for the programmes developed by the CINI centre for the prevention and treatment of SAM (Severe Acute Malnutrition) in childhood.

The sixth chapter is devoted to NUTRIMIX: a nutritional supplement made of cereals and pulses that is used and promoted by CINI as a means of prevention and treatment of malnutrition in children. The nutrimix represents for CINI is a programme of social business as it is not offered but sold for a price of 2 RS (Indian Rupees) per pack.

In conclusion, in the seven chapter, I reported six clinic cases of children affected by different degrees of malnutrition who were treated in the CINI rehabilitation clinic when I attended the center. The data were gathered through a questionnaire prepared by the dietitian working there.

Chapter 1

An overview to CINI organization

CINI helps today about 1,000,000 people per year who live in the Calcutta area and about 10,000 street children and workers. The organization relies exclusively on the work of Indian professionals specializing in health, nutrition, social sciences, education and training, and basic operators are working together to improve access to health care for of women and children who live in the poor communities poor and motivate the members of such communities to become active participants in their health.

The Child in Need Institute (CINI)

Every year CINI India:

- claims to serve 5 million people and 10,000 street children and workers with interventions in the fields of health, nutrition, schooling and child protection;
- by rehabilitating 700 severely malnourished children in the Pediatric Center and Rehabilitation Center Pediatric Nutrition and following approximately 30,000 children through out patient care;
- implements programs territorial health and nutrition for pregnant women and children;
- works in school and offers services to child victims of abuse, exploitation and violence;
- developing programs on empowerment of women in relation to the health and nutrition of women and children.

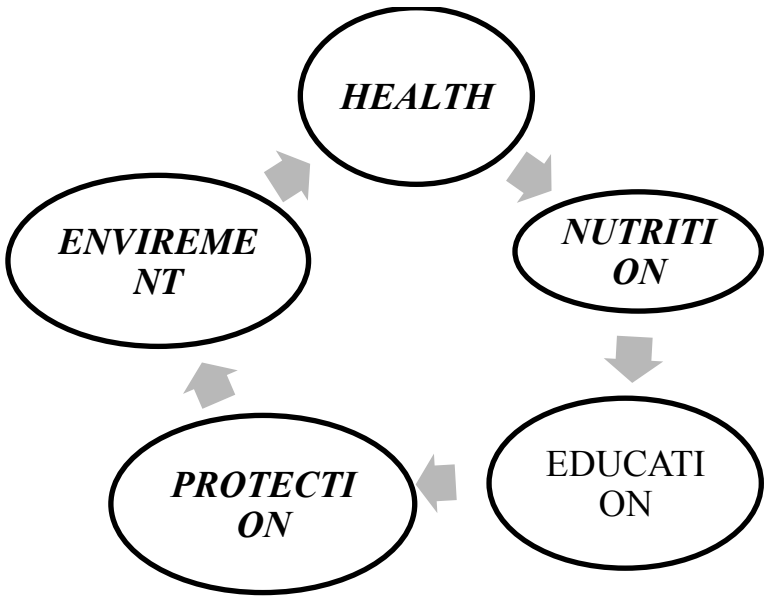
In order to optimize its operations and to be a real center of help for the people of India today CINI has opened several centers in urban and rural districts of West Bengal and the city of Kolkata, each of which is autonomous and independent in the

implementation of their projects.

PHILOSOPHY

The philosophy that guides the work of CINI is called Life Cycle Approach (Approach to Life Cycle). It identifies the most critical moments of life not only of the individual but of the whole of the community. The guiding philosophy is that the interventions are to be not base only in the diagnosis and treatment of health problems but through education aims to mitigate the cause of the underlying problem, with the hope of preventing the emergence of such issues in the new generation; with the conviction that knowledge, education of the individual and communities being the only tools capable of achieving a lasting improvement of the conditions of this country. Taking for example the aspect of prevention of malnutrition CINI provides the community with counseling by local nutritionist about the properties of foods, specific nutritional needs at different stages of life, the right combination of foods; with the ultimate aim of ensuring autonomy for families in improving their nutritional status of their children.

The conceptual pillars on which the CINI develops its activities are essentially summarized in five points:



The five key points of the method CINI

NUTRITION

At least 43% of Indian children under the age of 3 suffer from malnutrition[1]. Malnutrition is linked to half of the child deaths in India. A child who is malnourished in the womb or in its first two years of life will never be able to reach its full potential. Lack of proper nourishment in the womb can cause brain damage, still birth or neo-natal death. A child who is malnourished in the critical first two years of life, is likely to have permanent physiological damage resulting in increased susceptibility to illness and restricted capacity for education.The problems of malnutrition are not always as straightforward as a simple lack of food. Many families who have limited amounts of food do not always share it equally. Mothers and infants, especially girls, are rarely priorities.Traditionally in Indian families, women eat last; so when food is scarce, boys may receive more than girls; men more than women; older children more than younger children. Diet may be imbalanced due to a lack of understanding about nutrition as much as a lack of food availability; for example, less than half of Indian children under six months are exclusively breast fed. CINI's nutrition projects focus on educating women, especially pregnant and lactating mothers, to make the best of what is available. This is usually done by a health worker, a local woman who will be trained by CINI but who can engage with the women she is trying to help. CINI also runs an emergency ward for severely malnourished children, and a Nutrition Rehabilitation Centre where balanced food is provided in small but frequent amounts in order to increase a child's weight safely over a period of several weeks. The low cost model CINI uses to rehabilitate severely malnourished children has been recommended in the Right to Food Bill 2009, soon to be tabled in the Indian parliament. It has also been adopted by various state governments as part of the National Rural Health Mission intervention to reduce severe malnutrition. CINI was recently awarded a grant by the World Bank of $40,000 to help it produce its own nutritional supplement Nutrimix (already tried and tested in Kolkata) in commercial quantities.This low cost, fortified food supplement has been developed by a team of doctors and has an energy yield of 1700 calories per 500g.

[1] http://www.cini-india.org/br_activities2.asp

HEALTHCARE

Only 44% of children between 12-23 months are fully immunized against the six major preventable diseases. Nearly 80% of infants have anaemia. Only 52% of women have at least three ante natal care visits and only 39% have access to government services for ante natal care and delivery[2].Despite India's impressive economic growth, access to and the quality of healthcare have a long way to go. CINI works to fill gaps in the system by providing healthcare services.In addition to its emergency ward and nutrition clinic, CINI operates a series of drop-in clinics at its headquarters south east of Kolkata. Pregnant women and women with children up to the age of five can come and consult doctors and health workers about pre-natal care, breast feeding, nutrition, vaccination and childhood illnesses.Other health focused projects include educating people about HIV/AIDS and improving the lives of those with HIV/AIDS through the specialist unit CINI Bandhan. A number of further programmes concentrate on distributing supplements such as iron and folic acid to children in disadvantaged communities.

EDUCATION

There are two main aspects to CINI's work in education:

- Children

Around 40 million Indian children aged between 6-11 are not in school. Over half of India's children will not progress beyond elementary school. There are many reasons why poor children may not be in school in India. In some cases, they are unable to access education; in others, they are forced to work rather than go to school. Their families often do not value education or may believe that the traditional barriers to progress of caste, poverty and gender are too strong to overcome. CINI works to identify children who are either not in mainstream education or are in danger of leaving it. It offers bridging courses to enable children who are outside the education system to return to it. Using a network of key workers and counselors who are linked to schools and government, CINI works in

[2] http://www.cini-india.org/br_activities2.asp

local communities to convince families that the benefit of education will, in the long term, outweigh the benefit of the low and temporary wage which a child may earn instead of going to school. CINI also works to overcome forms of social exclusion such as caste and gender discrimination which continue to play a part in keeping children, particularly girls, out of school. In 2008 alone, 550 children were re-introduced to mainstream education thanks to CINI's efforts. It costs less than 350 rupees a month to support a child in education.

- Adults

Almost every project CINI undertakes involves education and raising awareness. Health workers are trained to educate women about their health and the health of their children; about how to take care of themselves when they are pregnant and breast feeding; about family planning; the benefit of institutional deliveries; the importance of child vaccination; and prevention of STDs. Children and families are taught about the benefits of education and adolescents are offered life skills and vocational training courses. CINI reaches out to government workers at all levels to share its knowledge and help them work effectively in poor communities. Perhaps most important of all, CINI aims to empower poor women and children by helping them take advantage of their rights and entitlements.

PROTECTION

Poor children are vulnerable children. India has the largest population of children in the world but also the highest number of children engaged in work. These children work not just in sweatshops and domestic service, but also in family businesses, or as careers of other family members. The number of children involved in work which seriously damages their education and holistic development is unknown but ranges from the government's 12.6 million to civil society estimates of 70-80 million children.Child trafficking is on the rise. Some children are snatched or tricked by traffickers; some are sold by their families (who in most cases believe that their children are being offered a better alternative) or inadvertently handed over to people who enslave them in child labour or as sex workers. CINI offers a number of education and protection services to children who are particularly vulnerable to abuse and exploitation. These services are concentrated in dangerous red

light areas and around stations. In these locations, CINI runs a number of temporary shelters, both on a drop in basis and as a half way house, for children in trouble. It then helps them return to their families wherever possible (often counseling the families in question) and does its utmost to re-integrate them into mainstream society. In partnership with the government, CINI provides a response team in West Bengal for calls to Childline, a 24 hour free telephone helpline which provides intervention and assistance to children in trouble. This service is used by adults and the police to report instances of child abuse, child labour and child trafficking but also by children themselves. Additionally, CINI operates a helpline for teens and for those with HIV/AIDS, offering them counseling and assistance. Additionally, CINI works with the police and judiciary in helping them track down trafficked children and prosecute traffickers and abusers.

CHILD & WOMAN FRIENDLY COMMUNITIES (CWFC)

CINI is piloting an innovative apporach whereby it integrates activiies in the areas of nutrition, healthcare, education and protection in particular geographical areas. The aim of this rights-based approach is to encourage active participation and co-operation of community elected representatives, service providers such as doctors and teachers, local self help groups and the women and children themselves in order to create child and woman friendly communities. CINI trains local women and government workers in all aspects of healthcare so that they can work effectively in the field.

CINI is a center of learning organization that is an organization that constantly arises in a position to learn, ready to listen to the voices of the many poor who writes Dominique La Pierre in his novel India mon amour, "do not make noise1": women, children, families and entire communities. The consciousness of the lack of a universal law of human dignity is the strength of the support that the Dr. Choudhuri with his life project. Listening and observation of everyday life of those who live in situations of poverty and social exclusion is a qualitative advantage in the activity of care and assistance to the poor. Based on this principle, CINI has achieved important goals, counting on the support and motivation of all its members and also on the innovativeness of its projects. The hallmarks of CINI, which are so flexible include a learning organization, mobilization and awareness of the

community, mutual trust between the operators teamwork at all levels, monitoring and evaluation of internal work and prompt correction during operation, involvement of all parties involved and consensus decision in relation to each intervention.[3].

[3] Tratto da: http://adottaunamamma.it/web/index.php?page=iniziative

1.1 CINI'S HISTORY

The Child in Need Institute (CINI) is an award-winning, registered Non Governmental Organisation (NGO), that primarily operates in West Bengal and Jharkhand. It has over 35 years of experience in the issues affecting poor women, children and adolescents from some of the most disadvantaged areas of India. CINI was set up in 1974 by Dr Samir Chaudhuri, a paediatrician working in Kolkata, Sister Pauline Prince IBVM and Rev. Fr. John Henrichs SJ. In fact, they opened the first 5 clinics in Behala and Thakurpur areas of South Calcutta where they started o receive mothers with their sick children. Dr Chauduhuri's mission to treat children with malnutrition has, over the years, grown into a highly regarded, comprehensive development project supported by a wide range of organisations including the Government of India and Save the Children. By listening to the people it is trying to help and helping them to help themselves, CINI has evolved over time and now tackles a range of the challenges facing India's poorest families. CINI helps mothers and children in India break free from the cycle of poverty. It reaches out across all levels of Indian society by going from door to door in the villages and slums as well as talking to locally elected representatives and influencing public policy. Adopting a multi-layered, rights based approach, CINI works towards a sustainable improvement in nutrition, healthcare and education while trying to protect children whose lives are blighted by poverty. CINI can be considered as a "learning organisation" listening to the voices of women, children and the community and at the same time working closely with the government and supplementing existing services funded by taxpayers, which are still inadequate. The idea of CINI is that non governmental organisations can complement efforts by the government to make health accessible to all and in particular to improve health, education and protection of children. One of CINI's first priorities consisted in preventing malnutrition and disease by teaching mothers simple and readily available ways of helping themselves. Moreover, CINI quickly realised that one of the main reasons why the children being treated were trapped in poverty was due to their lack of education. As a result, projects which focused on getting poor children into education and supporting them through to adulthood were established. At the same time, it was impossible to ignore the dangers facing poor women and children above and beyond inadequate nutrition and healthcare, so projects such as shelters and half way houses were

set up to protect abused and trafficked children, the homeless and child labourers. While considerable progress has been made in the years since CINI was set up and government services are slowly improving, there is still much to do. One of CINI's most important roles today is that of facilitator. It empowers people by communicating their rights and entitlements to them and helps women and children make use of those services already provided by the government. CINI also reaches out to every level of government from community leaders to policy makers to ensure that as much as possible is being done to help the poor, and to minimise the damage caused by ineffective governance.

CINI now has a wide range of projects which deal with the principal issues facing the poor in India: nutrition, healthcare, education and protection. CINI operates in some of the poorest areas in India. It is based primarily in West Bengal with its headquarters in Kolkata and, in addition, also runs projects in Jharkhand, Chattisgarh and Madhya Pradesh.

1.2 THE MANAGEMENT OF THE ORGANIZATION

CINI is today a large organisation with units in various parts of India and almost 1,000 employees. It has an annual budget of over $ 6,500,000.

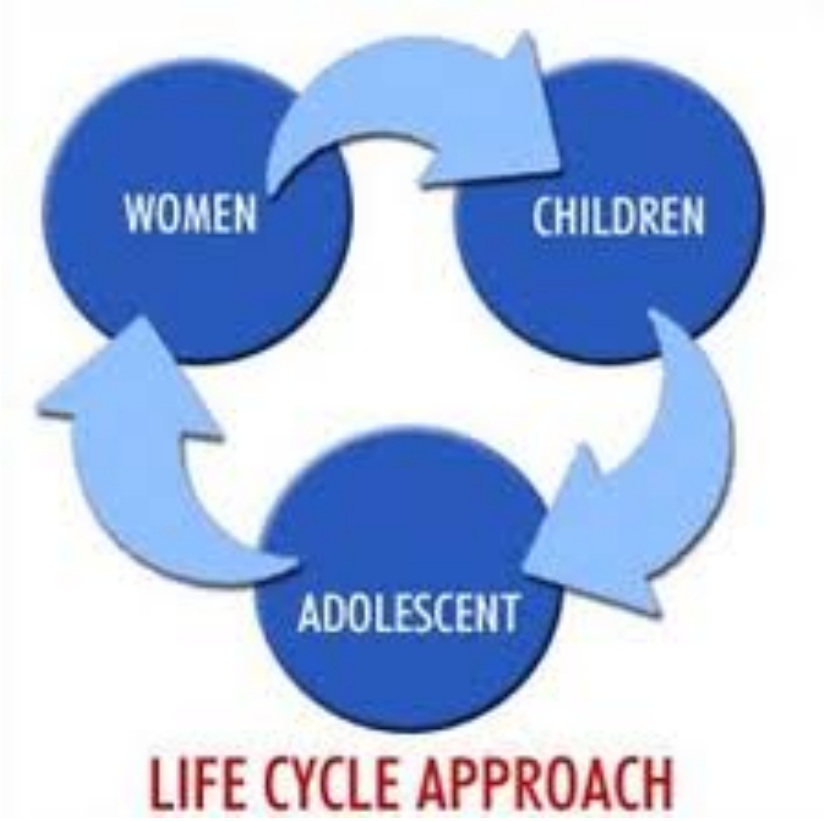
Although its constant growth over the years of institutional life, CINI has not resulted in a mega-organisation preferring a decentralised management. In fact, CINI has a decentralised structure and even the smallest of units of CINI has autonomy in decision making. The style of management is democratic and teamwork is very important. In its thirty years, CINI has attracted many medical doctors and other professionals coninced that what India needs is a behavioral change in which deseases are not only treated but prevented. CINI has generated a number of spin-off operations aiming to create entirely new non-profit organisations legally independent. However, all sister organisations has a thread that philosophically ties them with CINI. The institute plays an advisory and support role when required.

1.3 CINI AROUND THE WORLD

The foundation CINI International was launched in Italy in 2000. Its function is to set up independently registered charities around the world to support CINI in India. CINI supporting charities have already been set up in the UK, Italy, Belgium, Australia, the Netherlands and USA.

1.4 CINI's NUTRITION PROJECTS

CINI’s nutrition projects focus on educating women, especially pregnant and lactating mothers, to make the best of what is available. This is usually done by a health worker, a local woman who will be trained by CINI but who can engage with the women she is trying to help. Thus CINI's learning and evolvin policy consists in being rooted in the local community and at the same time dialoguing with the world. The most important result of this learning and evolving process is the Life Cycle Approach (LCA).



Life cycle approach

The Life Cycle Approach improves the health of women and children. It breaks the cycle of illness and poverty by engaging partners, communities, NGO's, governments and agiencies for better use of resources. This CINI's programme wants to prevent malnutrition during the period of intense growth and functional maturation. This has now been identified as the critical period of the human lifecycle such as pregnancy, the first two years of life and adolescence.

CINI-trained health workers visit families regularly to change behaviour so that husbands, mother in laws and other family members provide support and care to the pregnant woman. They explain good habits to follow for a pregnant woman such as eating frequent meals, accessing antenatal care regularly and delivering safely with trained birth attendants, thereby ensuring a newborn birth weight of over 2.5 kilograms. Moreover, Frequent visits help to ensure exclusive breast feeding, immunisation, supplementation with home available foods from the sixth month onwards, and monitoring and promoting growth up to 2 years of age. Early access to health care is provided in the community.

Adolescent girls and boys are provided health and nutrition education through trained peer educators. Here it is possible to find the description of the 3 critical stages of life as suggested by CINI's website (http://www.cinibelgium.org/lca.html):

1) The beginning of pregnancy (3rd month) up to the birth

A woman at the beginning of pregnancy suggest eating habits, rest time, abnormalities in pregnancy to recognize and prepare for childbirth, is an important first hurdle. The aim is to ensure that the child a birth weight of 2500 grams; then it makes a big survival and a good start.

2) The birth of the baby and the first two years

The next critical period, the first two years of the child (80% growth in the brains, building resistors, obtaining vaccinations).. With a strict monitoring of the growth curves, the occurrence of diseases, vaccination and the family situation, can the CINI employees or the mother herself rely on in time intervals and other measures. When a child reaches two years, the chances of survival grow very high.

3) The adolescence, the time when children are 12-19 years

The third period focuses on girls and boys about 12 years old, as a change of attitude must take place. Then breaks the period that they are or may be responsible for whether or not getting a child. Venereology, child pregnancy, sex health, training and the creation of an independent existence are CINI's issues.

To reach its aims CINI works through four divisions: 1) Child Health and Development, 2) Women's Health, 3) Adolescent Health and 4) Monitoring, Evaluation and Research.

1.5 CHILD HEALTH AND DEVELOPMENT DIVISION

Child Health and Development Division is primarily involved in implementing child health and nutrition related projects for children under three years.

1.6 WOMEN HEALTH DIVISION

Women Health Division provides sustainable health and nutrition development of women and children in need. CINI Women Health Division is primarily involved in planning and subsequent implementation of women's health specific programmes. The division

undertakes community based intervention programmes through micro-level approach which encompasses a gamut of components ranging from ensuring safe motherhood, child survival and growth to increasing male participation in women's reproductive health, and adolescent health issues. It also engages in advocacy at various levels of policy making.

1.7 ADOLESCENT RESOURCE CENTRE

The Adolescent Resource Centre is involved in research, documentation, training and technical capacity building, contributing towards the development of policies and programs through policy analysis, advocacy and information dissemination.

The objective of this division is to promote and protect the reproductive and sexual health and rights of young people, both married and unmarried, in the age group of 10-24 years. To achieve this objective AHD works along with other divisions within CINI and other government and non-government organizations.

The following table shows the significant results obtained by CINI's Life Cycle Approach in the period 2001- 2004:

INDICATORS	2001 (%)	2004 (%)
Registration of pregnant women with sub-Center (within 16 weeks)	78.0	91.3
Institutional delivery	58.6	61.9
Birth weight < 2.5 Kgs	21.1	17.5
Normal nutrition at 1 year	59.2	60.9
Colostrum feeding	75.6	87.3

Significant results obtained by CINI's Life Cycle Approach in the period 2001- 2004

Exclusive breast feeding upto 5-6 months	46.9	48.9
Infant mortality rate (per 1000 live birth)	31	23

Another programme connected to the Life Cycle Approach fighting children malnutrition starting from mothers' health in pregnancy is the "Adopt a Mother and Save her Child".

During years, CINI faced the problem to find long-term donors for malnutrition programmes on geographical or area basis. In fact, most of the donors preferred to fund 3-5 years projects and this is a too short period to bring about behavioural change in a comunity to prevent malnutrition and ill health. That's why CINI launched the "Adopt a Mother and Save her Child" programme, by getting individuals and organistaions to sponsor a mother during the critical time of pregnancy and first two years of life of the child.CINI also runs an emergency ward for severely malnourished children, and a Nutrition Rehabilitation Centre where balanced food is provided in small but frequent meals in order to increase a child's weight safely over a period of several weeks. The low cost model CINI uses to rehabilitate severely malnourished children has been recommended in the Right to Food Bill 2009, recognised by the Indian parliament. It has also been adopted by various state governments as part of the National Rural Health Mission intervention to reduce severe malnutrition. Another important goal of CINI is the

production of its own nutritional supplement Nutrimix. This low cost, fortified food supplement has been developed by a team of doctors and has an energy yield of 1700 calories per 500g. CINI was recently awarded a grant by the World Bank of $40,000 to help it produce its own nutritional supplement Nutrimix (already tried and tested in Kolkata) in commercial quantities.

Nutrimix is a cereal and pulse based food whose main ingredients are wheat or rice, Bengal gram or Green gram, sugar/jaggery, vegetable oil and water. It is a powder in which wheat or rice and pulses in the ratio of 4: 1 (i.e., 400g and 100g) are measured, roasted separately, ground to powder and mixed together. The mixture must be kept in a dry airtight container and used as required. One teaspoonful of Nutrimix' powder weighs approximately 3.0g and provides 10 Kcals of energy and 0.4 g of protein.

Chapter 2

CINI'S PROJECTS

To better understand the organization of CINI's projects, I would like first to explain that when we speak of CINI India we mean the unit of Poilan, a village near Kolcata. The CINI unit located in Polian consists of the Thursday Clinic, the rehabilitation clinic for nutritional problems, the administrative offices, the library and rhe hosting part for visitors.

This central unit employs CINI International Unit in order to create international networks and to keep the relationships with the government.

Delocalized from the central unit of Poilan there are several other structures in the city and in the villages. These secondary units develop CINI's projects and they also propose their specific projects and activities.

In the following sections, I explain the principal projects carried out by CINI.

2.1 THEMATIC DIVISION AND OPERATIONAL UNITS

The thematic divisions and units are bound together in a cohesive manner for achieving CINI's mission of "Sustainable development in education, protection health and nutrition of child, adolescent and woman in need"[4]

CINI, as already explained above, has developed several projects managed and organized by its different units. Below, I report the main projects of CINI, I was able to observe during my stay in India.

2.2 CWFC/ PROGRAMME MENAGEMENT UNIT (PMU)

The PMU (Programme Management Unit) of CWFC (Child & Woman Friendly Communities) has been set up to coordinate the activities undertaken in the rural and urban areas by the different units of CINI. It provides technical support in terms of capacity building, monitoring, evaluation, documentation as well as accounts and

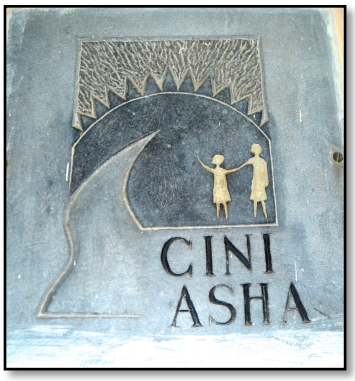
[4] Cini annual report 2010-11 pag.6

administration to the implementing units. It is also responsible for facilitating the various units to implements CWFC approach.

2.3 DIVISION OF CHILD HEALTH AND DEVELOPMENT (DCHD)

The Division of Child Health & Development (DCHD) started functioning in May 2001 with the drive for efficient and independent functioning on issues of child health, nutrition and development. DCHD is primarily responsible for implementing programmes and generating evidence related to child development, aimed at influencing the policies at the state, regional and national levels.

2.4 CINI ASHA (urban unit)



This unit was initiated in 1989 to respond to rhe needs of deprived urban children. It aims at improving the quality of life of disadvantaged urban population and protect the right of the children through education, health and social mobilization. This project is carried out in two building both located in Kolkata, one for males and the other for females. In the most severe cases, they become a home for street children.

CINI ASCHA, centre for boys and girls.

2.4.1 THE CHILD LINE: A NUMBER TO SAVE A CHILD

Inside the main section of CINI ASHA there is the office of "Child line": a phone number that spells hope for millions of children across India, Child line is India's first 24-hour, free, emergency phone service for children in need of aid and assistance. Whether you are a concerned adult or a child, you can dial 1098, the toll free number to access our services. The Child line responds to the emergency needs of children, but also links them to services for their long-term care and rehabilitation. To date, it has reached out to over three million children across the nation through such calls. Child line is a platform bringing together the Ministry for Women & Child Development, Government of India, Department of Telecommunications, street and community youth, non-profit organisations, academic institutions, the corporate sector and concerned individuals. Child line works for the protection of the rights of all children in general. But a special focus is on all children in need of care and protection, especially the more vulnerable sections, which include:

- Street children and youth living alone on the streets

- Child labourers working in the unorganised and organized sectors
- Domestic helpers, especially girl domestics
- Children affected by physical / sexual / emotional abuse in family, schools or institutions.
- Children who need emotional support and guidance
- Children of commercial sex workers
- Child victims of the flesh trade
- Victims of child trafficking
- Children abandoned by parents or guardians
- Missing children
- Run away children
- Children who are victims of substance abuse
- Differently-abled children
- Children in conflict with the law
- Children in institutions
- Mentally challenged children
- HIV/ AIDS infected children
- Children affected by conflict and disaster
- Political refugee children
- Children whose families are in crisis

2.5 CINI YUVA- ADOLESCENT RESOURCE CENTRE

The resource centre created in the year 2000 to adress the needs of young people.

This unit was formerly known as Adolescent Resource Centre (ARC), and it was renamed as CINI YUVA in 2008.Through youth participation and community mobilisation, CINI ARC envisages fostering an environment where Young People's (10-24 years) Reproductive and Sexual Health (YRSH) is realized. It is the first of its kind in eastern India. The centre has been contributing effectively towards improving adolescent and youth health status through piloting innovative programmes, networking, partnership and capacity building of stakeholders and research. The division implements various projects

through CINI Diamond Harbour and CINI Jharkhand Units.

2.5.1 CINI DIAMOND HARBOUR UNIT

The CINI Diamond Harbour Unit was established on November 30, 1997 and it has been working in the domains of health and nutrition, education and protection in Diamond Harbour Sub-Division, South 24 Parganas, West Bengal, India. The Unit's initiatives are driven by a partnership approach where local self-government bodies (Panchayat Raj Institutions or PRIs take the lead in planning, implementing and monitoring community development programmes. In fact, the PRIs even provide CINI administrative and logistic support.

2.6 CINI INTERNATIONAL UNIT

This unit keeps regular contact with all the Friends of CINI support groups outside India, facilitates international visitors to CINI, maintains database for sponsorship programme. It specifically addresses day-to-day activities relating to sponsorship administration, particularly related to "Adopt a Mother and Save her Child" (AAMSC) and "Educate a Child"(EAC). As already mentioned CINI support groups in Australia, Belgium, Holland, Italy, UK and USA.

2.7 RESEARCH AND TRAINING

CINI Chetana Resource Center is the training wing of the Child in Need Institute established in 1980 with the aim of providing appropriate and effective support services to the work of CINI through a range of training activities. The focus is on Health Management through the Life Cycle Approach. The centre was later registered as an independent body in 1989. CCRC has a multi-disciplinary, highly committed faculty

team specializing in Social Anthropology, Food and Nutrition, Child Development, Social work, Sociology, Education, Human Development, Mass Communication, Adolescent Reproductive Sexual Health and Women's Health Issues.

2.8 RESOURCE CENTER

In view of the fact, that health as a priority is never reflected in the community practices, which are basically a reflection of the social opinions, behaviour change communication (BCC) remains a crucial component of CINI's intervention strategies. In the course of its implementation process, CINI has gained experience not only in participatory communication with community but also in different media to integrate implementation with mass mobilization and advocacy. With the growth of the institution and the corresponding process of decentralization, the need of integrated communication efforts was increasingly felt. To address that the Resource Centre has been formalized to act as a specialized communication cell.

The main objectives pursued by the Resource Centre are the following:

- Serving as one stop source of information on CINI-CCRC, and gather all the Communication needs pertaining to life cycle based model.
- Collecting, storing and disseminating the information based on the experiences of CINI in institutional publications
- Providing support on management of communication programme
- Developing communication materials in accordance with the needs of CINI and other organizations
- Promoting networking with other international, national, regional and sub-regional bodies experienced in health and social communication
- Streamlining the monitoring mechanism related to communication programmes
- Maintaining and updating the CINI website

- Maintaining the automated library

Experts from CINI and CINI ASHA, are often called upon for consultation. In order to customize training to the needs of the client group, external consultants are also used, if required.

- Training Needs Assessment
- Training module and manual development
- Delivery of training programmes
- Resource material development
- Training consultancy

Chapter 3

Malnutrition: an overview

3.1 DEFINITION:

Malnutrition is defined by the standard medical dictionaries as " any disorder resulting from a deficiency or excess of one or more essential nutrients" in the developing world this is generally characterised as under-nutrition or protein energy malnutrition (PEM) whereby there exist varying degrees of deficiencies in essential nutrients. The Council on food nutrition of the American Medical Association explains this condition as "a state of altered functional and structural development of the organism resulting from the discrepancy between needs and income or utilization of nutrients that could lead to excess morbidity and mortality." A broader and more comprehensive definition is provided later by Stratton et al.[5] who describe malnutrition as a state of imbalance, deficiency or excess of energy, protein and other nutrients with effects measurable by assessment of body composition and / or functionality organs and define the prognosis in the short and long term[6]. This definition places more emphasis on the consequences of a dietary imbalance continued on the state of health. Such a situation, if not corrected, results in an increased incidence of various complications, increased mortality and reduced quality of life. Because of their development cycle, children have a growth potential that makes them particularly susceptible to the effects of malnutrition.

[5] Streatton et al; 2993. Cit in manuale di nutrizione clinica e scienze dietetiche applicate.

[6] Binetti Paola-Marcelli Marcello-Baisi Rosanna (2008) Manuale di nutrizione clinica e scienze dietetiche applicate luogo di ed, edizione [my transl.]:

3.2 CLASSIFICATION:

Malnutrition can be classified[7] into:

- Primary: derived from food, manifested in the absence of disease (a shortage of food for poverty, social isolation, famine etc.)
- Secondary: result of a pathological condition that can influence ingestion, digestion, absorption or the utilization of nutrients and their transport, increasing the excretion or the needs.

An alternative classification is possible if we consider cases in which nutritional deficiency or excess are responsible for malnutrition. According to those cases, the classification of malnutrition is two-fold:

- Global malnutrition: reduced food intake, increased energy expenditure, etc. ..
- Selective Malnutrition: deficiency syndromes of vitamin deficiencies, minerals trace elements.

In 1959, Jelliffe DB. used the term "protein and caloric malnutrition (PEM)" to include whole spectrum of nutritional disorder, including marasmus, marasmic-kwaschiorkor, and kwaschiorkor. These three states of malnutrition can be more clearly differentiated on the basis of clinical findings. Today, the syndrome protein energy malnutrition described by Williams et al. in 1932 is commonly described as severe acute malnutrition (SAM) in order to the differentiate it from more chronic conditions.

- Marasmus: The terms marasmus is derived from the Greek word marasmos, meaning "dying away", and is applied to severe malnutrition in infants. The aetiology of marasmus seems to be different from that of kwashiorkor. When energy diet is limited due to inadequate food intake, a hormonal response opposite to that seen in

Marasmic malnutrition with dehydration

[7] [7] Binetti Paola-Marcelli Marcello-Baisi Rosanna (year) **Manuale di nutrizione clinica e scienze dietetiche applicate luogo di ed, edizione [my transl.**

kwashiorkor emerges. Low insulin and high plasma cortisol results in amino acids being released from muscle, leading to their scarce availability for hepatic synthesis of protein and in particular in albumin. This results in severe muscle wasting, with normal albumin levels and hence no oedema. Absence of oedema in the presence of severe muscle-wasting is characteristic of marasmus. The child is very thin and wasted, with no subcutaneous fat and wasted muscles. The abdomen shows distension, and diarrhea is usual. Body weight is severely reduced below 60% of the international standard (national center for health statistics/ WHO)[8]. Marasmus and dehydration can both cause loss of skin elasticity, sunken eyes, and a sunken fontanelle. To find out if a marasmic child is dehydrated, look for other signs, such as thirst and dry mouth. The marasmic child s often ipsychologically irritable and apathetic.

The main causes leading to marasmus are:

I. Difficulty with breast-feeding: A child's mother may have had too little breast-milk, or she may have died, she may try to bottle-feed him, but not be able to buy enough milk;
II. Wrong sterilization of bottles leading to diarrhoea: the mother consequently stopped feeding the baby, because she thought that this was the right treatment;
III. Older children can also get marasmus if they do not eat enough food.

- Kwashiorkor/ ipoalmbuminemic malnutrition: Kwashiorkor, which is predominant in older infant and young children, results from a combination of a diet with an inadequate protein intake and/or superimposed infection. The clinical picture is characterized by oedema, skin lesions, hair changes, apathy, anorexia, a large fatty liver, and a decrease in energy intake

Kwashiorkor

[8] Cit in in Principles and Practice of Medicine,2002, Nutritional, metabolic and enviromental desease, pag 313-314

Weight loss is also usually seen. A typical diet leading to Kwashiorkor would consist in cassava, yam, plantains, sweet potatoes or refined and diluted cereals . This has led to the term “sugar baby”. The etiophatogenesis of kwashiorkor is summarised in the Figure 3. The oedema of Kwashiorkor can only partially be explained by the low serum albumin; other contributing factors include to high plasma insulin levels, increased cortisol level and an inability to inactivate antidiuretic hormone. This in turn promotes the uptake of amino acid by muscle, diverting these substrates away from the liver. As a consequence, there is a reduced synthesis of albumin (resulting in hypoalbuminaemia, which causes oedema) and of lipoproteins predisposing to a fatty liver. The presence of infections may divert amino acids into the synthesis of acute phase protein and thus contribute further to reduce hepatic synthesis of albumin. Free radicals have also been implicated in the causation of kwashiorkor. It is thought that the imbalance between the production of this toxic radicals and their safe disposal result in to characteristic occurrence of oedema and skin lesions seen in children with kwashiorkor. Clinically the child presents with bilateral pitting oedema and is miserable, apathetic and often anorexic. There is some wasting, particularly in the shoulders and upper arm. The child may have a “moon face” and even a “pot belly”, the letter due weakness of the abdominal muscles. There are symmetrical skin changes in the buttocks, inner thighs and perineum. These areas are at fist pigmented and thickened, then cracks appear and lead to denuded areas of shallow pigmentation. Confluent areas

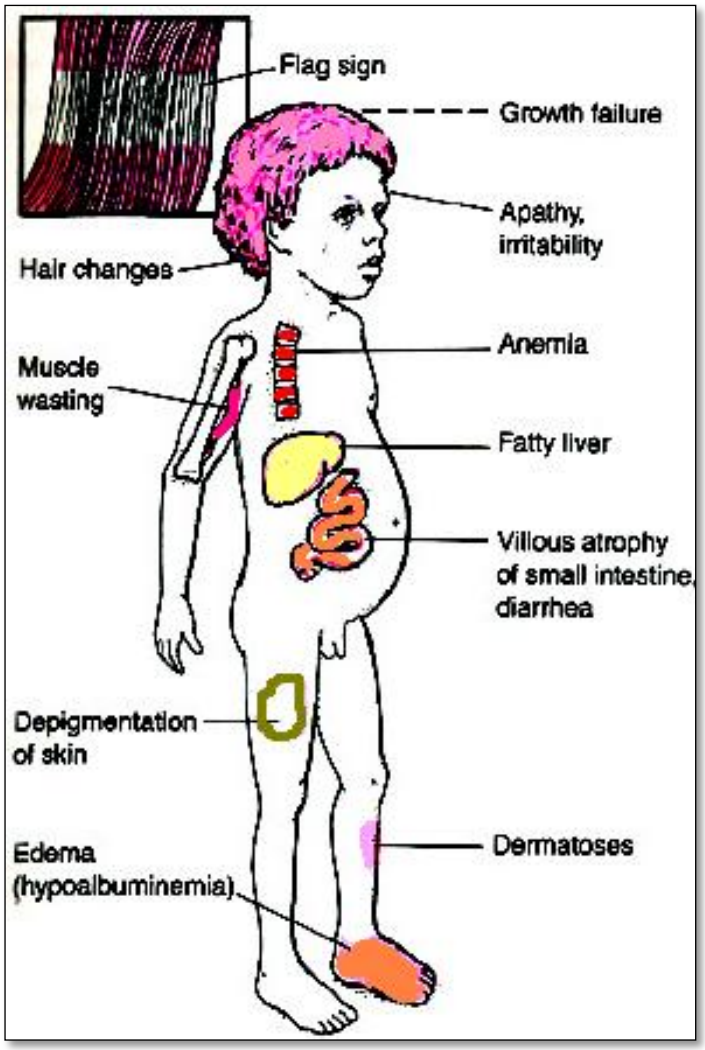


Fig. 19 Characteristic sign of kwashiorkor

with this characteristic dermatitis have been termed "flaky-paint" or "crazy-paving" dermatitis.

The hair alters color from black to blond, reddish or grey, because thin, sparse and loose and can be easily plucked.[9]

Victims of kwashiorkor fail to produce antibodies following vaccination against diseases, including diphtheria and typhoid. The literally meaning of Kwashiorkor is "the disease of the deposed baby when the next one is born"[10].

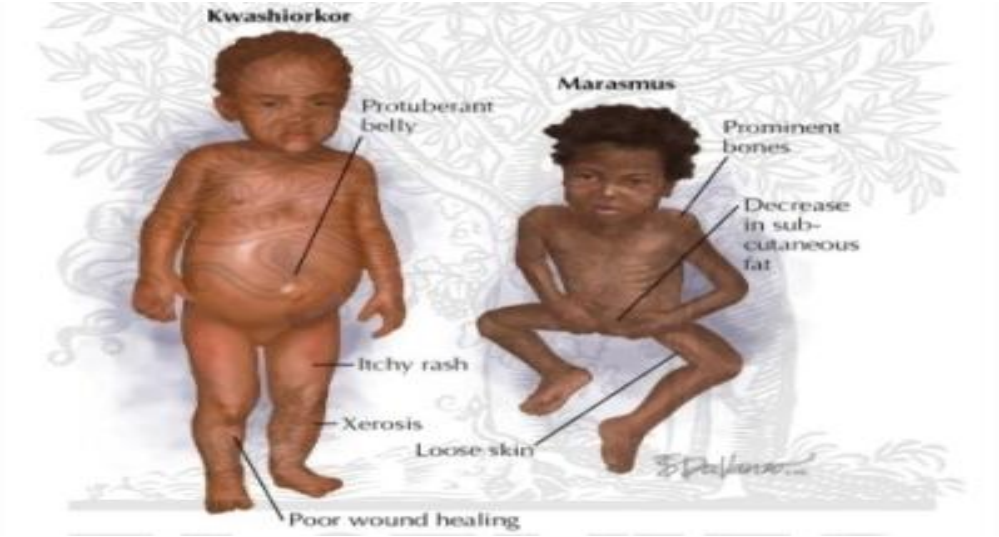
- mixed type : The child with marasmic- Kwashiorkor has clinical findings of both marasmus and Kwashiorkor. Characteristically, the child with marasmic-Kwashiorkor has oedema and gross wasting and is usually stunted. These children usually have mild hair and skin changes and a palpable fatty- infiltrated liver.
  In addition to alterations of growth, are common digestive disorders, immune (cell-mediated immunity, phagocytosis, and the complement cascade), fluid and electrolyte, micronutrient and protein synthesis, are also involved in the cognitive and behavioural development. In children with an acute or chronic marasmic-Kwashiorkor, these mechanisms interfere negatively on the response to medical or surgical treatment. In practice, a chronic condition of chaos is associated with a catabolic event: it is the typical example of wasting syndrome in patients with HIV.

3.3 DIFFERENCE MARASMUS/ KWASHIORKOR:

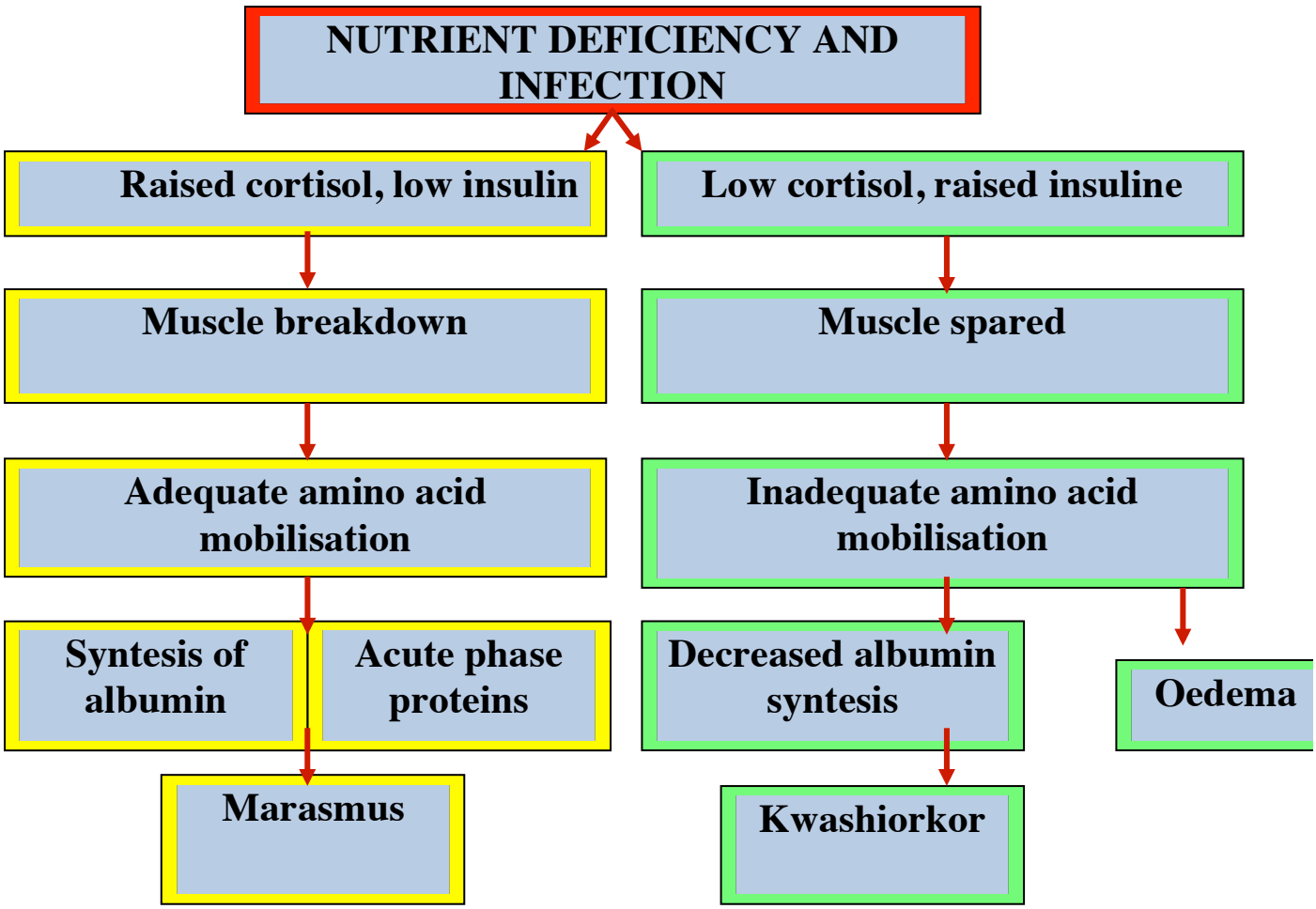
Kwashiorkor and marasmus differ in several ways. Marasmus is more common. Marasmic children are much thinner than children with kwashiorkor. They are more active and less apathetic and they don't have edema. They are hungry and they do not die so easily. Marasmic children take longer to recover. The typical signs of kwashiorkor are: muscle wasting, edema, and a flaking paint rash, he is seriously ill.

[9] Cit in Principles and Practice of Medicine,2002, Nutritional, metabolic and environmental desease,313-314

[10] Tratto da:Nutrition and Behaviour, a multidiscilplinary approach, J. Woreby, B.J. Tapper, R. Kanarek, 2005, chapter 6, pag 64: features of protein-energy malnutrition.



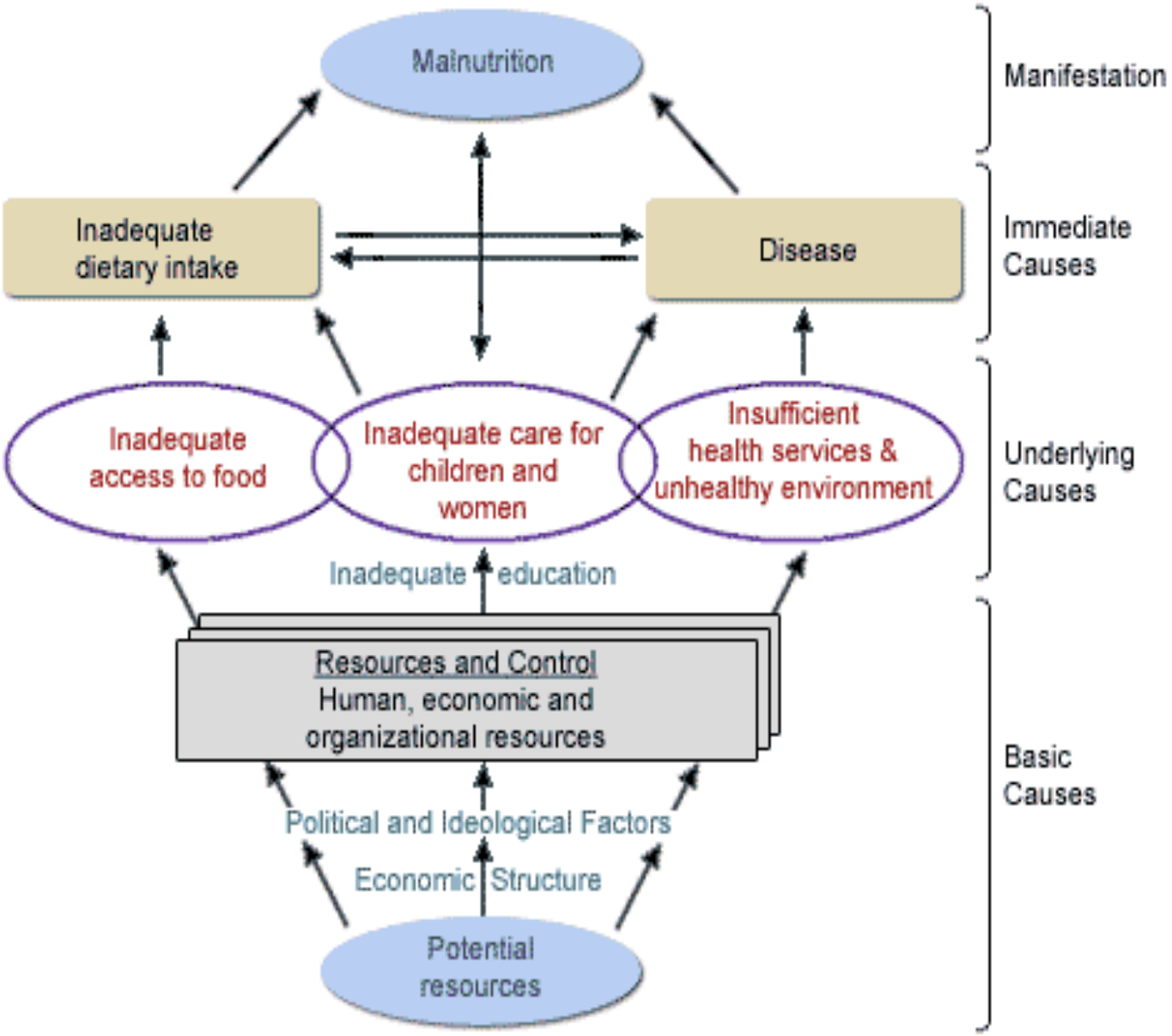
Differences marasmus/ kwashiorkor



Schematic outline of the aetiophatogenesis of severe PEM in children.

3.4 CAUSES OF MALNUTRITION

The concept of malnutrition as having multivariate causes has been discussed for many decades and a number of models have been developed in an attempt to explain them. The most widely used of these is the first published by UNICEF in 1990, and is entitled "The Causes of Malnutrition" (Figure 4). The figure below illustrates the principal and general causes of malnutrition. This scheme was reported by UNICEF in the text "the causes of malnutrition".



Causes of severe malnutrition adapted from UNICEF 1990

http://foodsecurity.gov.kh/conceptual-framework-malnutrition 13/9/12

3.5 METABOLIC EFFECT OF MALNUTRITION ON THE CHILD.

In the foctus and in the young child, the intrauterine and ectopic malnutrition may have an impact that could have ripercussions for lifetime[11]. For the child with an acute or chronic hospitalization and the response to terapy. About that UNICEF says:

Child malnutrition significantly increases the risk of infant and child death, with some estimates suggesting that child malnutrition is responsible for half or more of child deaths in the developing world[12]. A child's body responds to PEM in two ways that can be measured by anthropometry: a deceleration or cessation of growth, which in the long term results in low height for age or stunting; and body-wasting and/or nutritionl oedema, which are short term responses to inadequate nutritional intakes that often occur in combination with infection. Wasting is commonly assessed by weight relative to height and nutritional or bipedal oedema. The indicators height for age and weight for height thus discriminate between different biological processes and result in different clinical, bio-chemical and functional characteristics. Under weight or low weight for age is a composite indicator that conflates stunting and wasting and is used as an official indicator of progress toward achieving the first Millennium Development Goal (MDG): eradication of extreme poverty and hunger. Starting with Pelletier's work in the 90s[13], many studies now estimate that malnutrition is an underlying factor in over 50% of the 10-11 million children under 5 years who die each year of preventable causes (Figure5). This malnutrition encompasses stunting, wasting, intra-uterine growth

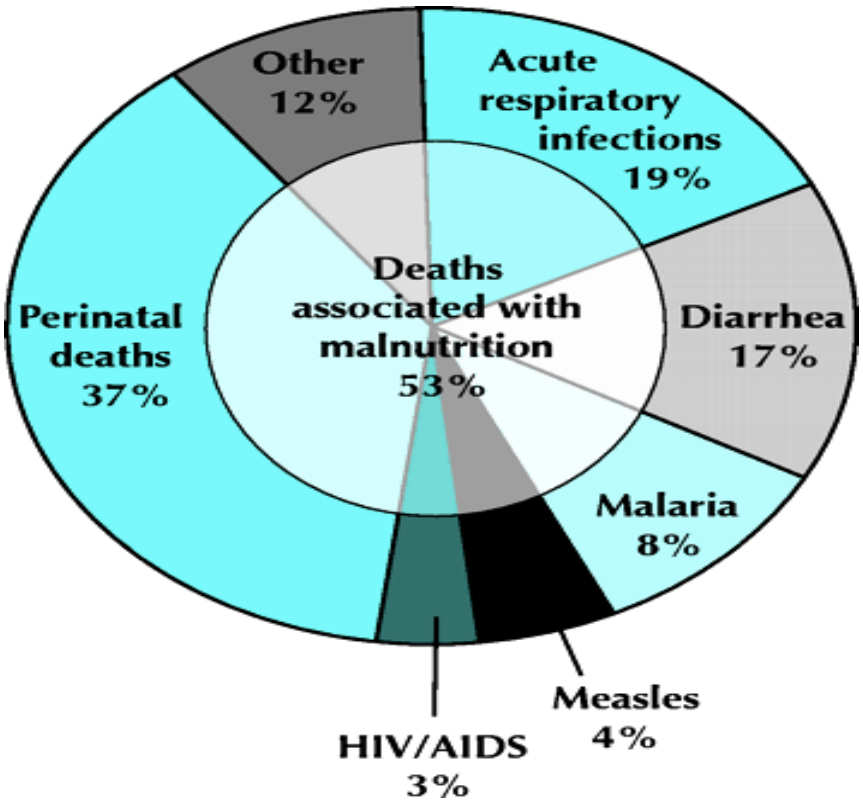


Fig 23:Causes of death among children under 5 years of age.

[11] http://onlusrandazzo.altervista.org/file/glne.pdf (accessed on 31/07/2012)
[12] (UNICEF. The state of the world's children. New York, Oxford University Press, 1998.)
[13] Palletier's et al;1995, pag:443-448

retardation (or low birth weight) and deficiencies of essential vitamins and mineral (collectively referred to as micronutrients) it is important to know that the risk of death increases with descending z scores for all categories of weight malnutrition: underweight, stunting, or wasting; as well as for infants born with low birth. The link between malnutrition and child mortality is brought about by compromised immunity. Malnutrition and infection are intertwined in a synergistic vicious cycle (14). Malnutrition reduces immunity and raises the risk of mortality by increasing the likelihood that the illness will be prolonged or become severe. A more prolonged or severe illness is more likely to cause and/or aggravate malnutrition by causing appetite loss, malabsorption, metabolic changes and behavioural changes which affect feeding with low birth weight practices and thus deplete body nutrient stores (5). These effects are summarised in a WHO discussion paper "that deals with causes and consequences of malnutrition word wild"

3.6 MANAGEMENT OF MARASMUS OR KWASHIORKOR

The principles of management of severely malnourished children are given in Table 1. The management consists in two phases. The first phase is stabilisation, which may last up to 7 days; phase two is rehabilitation. Hypoglycaemia, hypothermia, dehydration and electrolyte disturbances should be corrected during the stabilisation phase, together with the treatment of possible infections. Malnourished children are very susceptible to a number of infections. Cautious feeding is commenced in the stabilisation phase and the amount and type of food are both important. Re-feeding should consist of small, frequent feeds of milk- based starter formula, gradually increasing energy intake to 0.4 Mj/Kg (100 Kcal/Kg) and protein to 1-1.5 g/Kg per day. The feeding procedures are essentially the same for both types of severe PEM but in kwashiorkor the child's anorexia necessitates more intensive hand feeding. Feeds could vary in the different centres but are usually

based on dried skimmed milk mixed with flour, sugar and oil and are given 5-6 times (or more) during the day and also at the night time. Potassium, magnesium, zinc, and a multivitamin mixture are also administered. Associated conditions, including vitamin A deficiency, severe anaemia, dermatitis and diarrhoea, need appropriate medical attention. Severe PEM is associated with high mortality even in well- equipped hospitals. However, it has been shown that meticulous adherence to the above steps can reduce mortality dramatically.

Table 1. Steps in the menagement of a severely malnourished child during the stabilisation phase.

1. Treat or prevent hypoglicaemia
• 10% glucose or sucrose or a feed, frequently every 2 hours, day and night
2. treat or prevent hypotermia
• Keep child warm and feed frequently
3. treat or prevent dehydration
• Do not use i.v. fluids or oral rehydratation solution (ORS); use modified solution with elecrolyte and mineral solution
4. correct electrolyte inbalance
• Used modifoed ORS with less sodium and with extra potassium and magnesium.
5. treat infections
• Administer broad-spectrum antibiotics as a rutine
6. correct icronutrient deficiency
• Give multivitamin supplements, folic acid and zinc, avoid iron until child starts gaining weight
7. stats feeds cautiosytly: small, frequent, milk.basedfeeds
• 0.4MJ/Kg(100 Kcal/Kg) energyand 1-1.5 g protein/Kg per day; encurange beastfeeding

Chapter 4

THE MALNUTRITION PROBLEM IN INDIA

4.1 GENERAL ASPECT

In developing countries, children and adults are vulnerable to malnutrition because of low dietary intakes, infectious diseases, lack of appropriate care, and inequitable distribution of food within the household. India has a higher prevalence of child malnutrition, as manifested in stunting and underweight, than any other large country and was home to about one-third of all malnourished children in the world in the early 2000s. There are, however, substantial inter-state differences in child malnutrition and also in the (generally meagre) progress made since the early 1990s. The persistence of widespread malnutrition may seem surprising considering the recent overall shining performance of the Indian economy. Even though, India is committed to halving the number of underweight childrens has one of the indicators of progress to reach the millennium development goal (MGD). According to the NFHS-3, which is the most recent household survey containing information on child nutrition, nearly one-half of children aged 0-35 months are underweight or stunted and for children 6-59 months, 26% have mild, 40% have moderate, and 3% have severe anemia. Malnutrition is the major underlying cause of 50% of deaths among children. About18-23 percent of children are severely underweight or stunted in the sense of being more than three standard deviations below the relevant National Center for Health Statistics (NCHS) standards. 8.3 million babies are born with a weight less than 2,500 gr.

Suboptimal infant and young child feeding practicies in particular continue to be a serious challenges to reducing malnutrition among children. In fact, only 23% of children below three years of age in India initiated breastfeeding within one hour of birth as recommended by WHO. Moreover, less than half (46%) of children under six months of age are exclusive breastfed. In the subsequent stage of early life (six-nine month), only half (56%) of children are provided with the recommended semi-solid complementary foods and breast milk. Furthermore, only one in four children aged 12-35 months receives the six monthly vitamin A supplement.

To sum up, figures show that appropriate feeding practices in children under 2 years are crucial for intellectual and physical development and that malnutrition among children under 2 years of age has serious lifelong consequences.

4.2. NFHS 3 INDIA'S LAST SURVEY ON CHILDREN NUTRITION.

The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India. The NFHS is a collaborative project of the International Institute for Population Sciences (IIPS), Mumbai, India; ORC Macro, Calverton, Maryland, USA and the East-West Center, Honolulu, Hawaii, USA. The Ministry of Health and Family Welfare (MOHFW), Government of India, designated IIPS as the nodal agency, responsible for providing coordination and technical guidance for the NFHS. NFHS was funded by the United States Agency for International Development (USAID) with supplementary support from United Nations Children's Fund (UNICEF). The first National Family Health Survey (NFHS-1) was conducted in 1992-93. The survey collected extensive information on population, health, and nutrition, with an emphasis on women and young children. All the state-level and national-level reports for the survey have already been published (48 reports in all). The second National Family Health Survey (NFHS-2) was conducted in 1998-99 in all 26 states of India with added features on the quality of health and family planning services, domestic violence, reproductive health, anemia, the nutrition of women, and the status of women. The results of the survey are currently being published. The third National Family Health Survey (NFHS-3) was carried out in 2005-2006. Eighteen Research Organizations including five Population Research Centres carried out the survey in 29 states of India. The funding for NFHS-3 is provided by USAID, DFID, the Bill and Melinda Gates Foundation, UNICEF, UNFPA, and MOHFW, GOI. ORC Macro, USA, is providing technical assistance for NFHS-3, and the National AIDS Control Organization (NACO) and the National AIDS Research Institute.

The NFHS3 deals with a number of issues (households, family planning, fertility rates, infant health and mortality, maternal health, population nutrition, domestic violence, etc.), but the present work being interested in child malnutrition in India will only deal with those sections on the topic.

The WHO growth standard identifies breastfed child as the normative model for growth and development standards, depicts normal early childhood growth under optimal environmental conditions, and can be used to assess children regardless of ethnicity, socioeconomic status, and type of feeding. Three standard indices of physical growth that describe the nutritional status of children are presented in the NFHS-3:

• Height-for-age (stunting)

• Weight-for-height (wasting)

• Weight-for-age (underweight)

Each of the three nutritional status indicators is expressed in standard deviation units (Z-scores) from the median of the reference population. Each index provides different information about growth and body composition, which is used to assess nutritional status. The height-for-age Children whose height-for-age Z-score is below minus two standard deviations (-2 SD) from the median of the reference population are considered short for their age (stunted) and are chronically malnourished. Children below minus three standard deviations (-3 SD) from the median of the reference population are considered to be severely stunted.

In the NFHS-3 survey:

1) Stunting means a failure to receive adequate nutrition over a long period of time and is also affected by recurrent and chronic illness. For this reason, height-for-age represents the long-term effects of malnutrition in a population and does not vary according to recent dietary intake. The weight-for-height index measures body mass in relation to body length and describes current nutritional status. Children whose Z-score is below minus two standard deviations (-2 SD) from the median of the reference population are considered thin (wasted) for their height and are acutely malnourished.

2) Wasting is the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. According to the WHO, children whose weight-for-height is below minus three standard deviations (-3 SD) from the median of the reference population are considered to be severely wasted. Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both acute and chronic malnutrition. Children whose weight-for-age is below minus two

standard deviations from the median of the reference population are classified as underweight. Children whose weight-for-age is below minus three standard deviations (-3 SD) from the median of the reference population are considered to be severely underweight. The validity of these indices is determined by many factors, including the coverage of the population of children and the accuracy of the anthropometric measurements. In the NFHS-3 height and weight data were collected in all sample households and the survey was not able to measure the height and weight of all eligible children, usually because either the child was not at home at the time of the health investigator's visit or the mother refused to allow the child to be weighed and measured. In India, NFHS-3 did not measure 9 percent of children under age five.

Results show that almost half of children under five years of age (48 percent) are stunted and 43 percent are underweight. The proportion of children who are severely undernourished is also significative — 24 percent according to height-for-age and 16 percent according to weight-for-age. Wasting is also quite a serious problem in India, affecting 20 percent of children under five years of age. Moreover, the proportion of children who are stunted or underweight increases rapidly with the child's age through age 20-23 months. However, even when breastfed during the first six months of life, 20-30 percent of children are undernourished according to the three nutritional indices. furthermore, data highlight that at age 18-23 months, when many children are being weaned from breast milk, 30 percent of them are severely stunted and one-fifth are severely underweight (table A). No noticeable differences considering gender can be observed, in fact girls and boys are about equally undernourished.

Table A Nutritional Status of children

Table 10.1 Nutritional status of children

Percentage of children under age five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, India, 2005-06

Background characteristic	Height-for-age			Weight-for-height				Weight-for-age				
	Percentage below -3 SD	Percentage below -2 SD[1]	Mean Z-score (SD)	Percentage below -3 SD	Percentage below -2 SD[1]	Percentage above +2 SD	Mean Z-score (SD)	Percentage below -3 SD	Percentage below -2 SD[1]	Percentage above +2 SD	Mean Z-score (SD)	Number of children
Age in months												
<6	8.4	20.4	-0.6	13.1	30.3	4.1	-1.2	10.9	29.5	1.0	-1.4	3,845
6-8	10.8	25.9	-1.0	10.1	29.3	3.1	-1.1	13.7	34.7	0.6	-1.5	2,570
9-11	12.8	32.0	-1.2	10.9	28.9	1.6	-1.2	14.1	36.7	0.2	-1.6	2,086
12-17	21.7	46.9	-1.8	7.3	23.3	1.7	-1.1	14.2	40.2	0.3	-1.7	4,642
18-23	30.4	57.8	-2.2	7.6	22.2	1.1	-1.1	19.5	45.9	0.2	-1.9	4,636
24-35	28.9	55.9	-2.2	5.0	16.7	0.9	-1.0	17.7	44.9	0.4	-1.9	9,335
36-47	27.8	54.3	-2.1	4.7	15.5	1.0	-0.9	16.6	45.6	0.2	-1.9	9,780
48-59	23.9	50.3	-2.0	4.1	15.7	1.3	-1.0	15.3	44.8	0.3	-1.9	9,762
Sex												
Male	23.9	48.1	-1.9	6.8	20.5	1.7	-1.0	15.3	41.9	0.4	-1.8	24,346
Female	23.4	48.0	-1.9	6.1	19.1	1.4	-1.0	16.4	43.1	0.3	-1.8	22,309
Birth interval in months[2]												
First birth[3]	18.0	41.1	-1.6	5.4	17.8	2.0	-0.9	12.1	36.1	0.5	-1.6	13,546
<24	30.4	55.6	-2.2	6.1	18.9	1.4	-1.0	19.0	47.6	0.1	-2.0	8,448
24-47	26.0	51.2	-2.0	7.3	21.8	1.2	-1.1	17.9	46.2	0.3	-1.9	16,976
48+	20.9	44.7	-1.7	6.9	20.4	1.7	-1.1	14.5	40.3	0.5	-1.7	6,367
Birth order[2]												
1	17.9	41.0	-1.6	5.4	17.8	1.9	-0.9	12.0	36.1	0.5	-1.6	13,473
2-3	22.2	47.8	-1.8	6.3	19.6	1.6	-1.0	14.4	41.4	0.3	-1.8	20,032
4-5	30.4	54.3	-2.1	7.6	21.8	1.0	-1.1	21.2	49.9	0.2	-2.0	7,640
6+	37.2	61.0	-2.3	8.7	24.5	0.9	-1.2	26.3	56.6	0.3	-2.2	4,192
Size at birth[2]												
Very small	28.2	53.4	-2.1	9.6	28.7	1.0	-1.3	23.6	54.0	0.3	-2.1	2,533
Small	27.3	53.9	-2.0	8.2	25.8	1.5	-1.2	20.5	51.5	0.2	-2.0	6,664
Average or larger	22.7	46.5	-1.8	5.9	18.2	1.6	-1.0	14.5	40.1	0.4	-1.7	35,575
Residence												
Urban	17.6	39.6	-1.6	5.7	16.9	2.5	-0.8	10.8	32.7	0.6	-1.5	11,337
Rural	25.6	50.7	-2.0	6.7	20.7	1.2	-1.1	17.5	45.6	0.3	-1.9	35,318
Mother's education[4]												
No education	31.6	57.2	-2.2	8.0	22.7	1.1	-1.2	22.1	52.0	0.2	-2.1	22,730
<5 years complete	24.1	50.4	-1.9	6.2	20.8	1.1	-1.1	15.6	45.8	0.2	-1.9	3,361
5-7 years complete	20.3	45.6	-1.8	5.5	18.8	1.8	-1.0	12.3	38.5	0.4	-1.7	6,748
8-9 years complete	15.6	40.7	-1.6	5.2	17.5	1.9	-0.9	9.4	34.9	0.3	-1.6	5,514
10-11 years complete	10.9	33.0	-1.4	3.9	14.3	2.2	-0.8	6.5	26.8	0.9	-1.3	3,530
12 or more years complete	7.0	21.9	-1.0	4.0	12.8	2.6	-0.6	4.5	17.9	0.8	-1.0	3,995
Religion												
Hindu	23.4	48.0	-1.9	6.6	20.3	1.5	-1.0	16.1	43.2	0.3	-1.8	36,675
Muslim	26.2	50.3	-2.0	6.1	18.4	1.6	-0.9	15.6	41.8	0.4	-1.8	7,758
Christian	17.9	39.0	-1.5	5.1	15.5	3.1	-0.7	8.7	29.7	0.9	-1.4	929
Sikh	13.4	29.8	-1.3	2.8	11.0	1.9	-0.6	7.8	22.0	0.7	-1.1	619
Buddhist/Neo-Buddhist	23.2	56.1	-1.9	7.0	21.0	3.1	-0.9	14.7	39.2	0.8	-1.7	316
Jain	5.9	31.2	-1.2	5.2	15.8	0.8	-0.9	6.6	24.0	0.0	-1.3	78
Other	34.0	58.5	-2.2	10.5	33.6	1.3	-1.5	35.4	62.7	0.1	-2.4	233
Caste/tribe												
Scheduled caste	27.6	53.9	-2.1	6.6	21.0	1.3	-1.1	18.5	47.9	0.3	-1.9	9,531
Scheduled tribe	29.1	53.9	-2.1	9.3	27.6	1.5	-1.3	24.9	54.5	0.4	-2.1	4,448
Other backward class	24.5	48.8	-1.9	6.6	20.0	1.3	-1.0	15.7	43.2	0.3	-1.8	18,969
Other	17.8	40.7	-1.6	5.2	16.3	2.1	-0.8	11.1	33.7	0.5	-1.5	13,351
Don't know	22.3	45.8	-1.8	3.1	14.1	1.4	-0.9	16.3	35.1	0.0	-1.7	193
Mother's interview status												
Interviewed	23.7	48.1	-1.9	6.5	19.9	1.5	-1.0	15.9	42.6	0.4	-1.8	45,337
Not interviewed but in household	22.8	47.5	-1.7	7.9	18.0	0.3	-1.0	14.9	38.5	0.3	-1.7	541
Not interviewed and not in household[5]	20.7	45.3	-1.7	4.8	16.4	2.3	-0.9	13.1	36.9	1.0	-1.6	778
Mother's nutritional status												
Underweight (BMI<18.5)	27.3	53.5	-2.1	7.9	25.2	1.1	-1.3	20.9	52.0	0.2	-2.1	17,656
Normal (BMI 18.5-24.9)	22.5	46.3	-1.8	5.9	17.4	1.7	-0.9	13.6	38.7	0.4	-1.7	24,510
Overweight (BMI ≥ 25)	12.0	31.2	-1.3	2.7	9.3	3.0	-0.5	4.6	20.1	1.0	-1.1	3,159
Mother not measured	28.9	51.7	-1.9	7.7	19.6	1.4	-0.9	19.6	41.3	0.3	-1.7	524

Continued...

National Family Health Survey (NFHS-3), 2005-06, pag 270.

As the NFHS-3 reports:

- Undernutrition is generally lower for first births than for subsequent births and short birth intervals are associated with higher levels of undernutrition.
- Undernutrition is substantially higher in rural areas than in urban areas (40 percent of children are stunted and 33 percent are underweight).
- Undernutrition has a strong negative relationship with the mother's education. The percentage of children who are severely underweight is almost five times as high for children whose mothers have no education as for children whose mothers have 12 or more years of education.
- As far as religion is concerned, on the one hand, Hindu and Muslim children are about equally likely to be undernourished; on the other hand, Christian, Sikh, and Jain children are considerably better nourished.
- Children belonging to scheduled castes, scheduled tribes, or other backward classes have relatively high levels of undernutrition according to all three measures.
- It is worth noting that children who do not live with either parent have slightly better nutritional status than those who live with both parents or with only one parent.
- The nutritional status of children is strongly related to maternal nutritional status. Undernutrition is much more common for children of mothers whose body mass index is below 18.5 than for children whose mothers are not underweight.
- When the wealth index of the household increases, th level of undernutrition decreases. Children from households with a low standard of living are twice as likely to be undernourished as children from households with a high standard of living.
- Inadequate nutrition is a problem concerning the whole India, but the situation is considerably better in some states than in others. Table B shows that undernutrition is most pronounced in Madhya Pradesh, Bihar, and Jharkhand. Nutritional problems are also substantially higher than average in Meghalaya and (for stunting) in Uttar Pradesh. On the other hand, are least evident in Mizoram, Sikkim, Manipur, and Kerala, in Goa and Punjab. Even in these states, however, levels of undernutrition are unacceptably high.

Comparing results from NFHS-2 and NFHS-3, the proportion of children under three years of age who are underweight decreased from 43 percent in NFHS-2 to 40 percent in NFHS-3, and the proportion severely underweight decreased from 18 percent to 16 percent. Moreover, stunting decreased from 51 percent to 45 percent and severe stunting also decreased from 28 percent to 22 percent.

Table B

Table 10.2 Nutritional status of children by state

Percentage of children under age five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, according to state, India, 2005-06

State	Height-for-age			Weight-for-height				Weight-for-age			
	Percent-age below -3 SD	Percent-age below -2 SD[1]	Mean Z-score (SD)	Percent-age below -3 SD	Percent-age below -2 SD[1]	Percent-age above +2 SD	Mean Z-score (SD)	Percent-age below -3 SD	Percent-age below -2 SD[1]	Percent-age above +2 SD	Mean Z-score (SD)
India	23.7	48.0	-1.9	6.4	19.8	1.5	-1.0	15.8	42.5	0.4	-1.8
North											
Delhi	20.4	42.2	-1.6	7.0	15.4	4.0	-0.5	8.7	26.1	1.0	-1.3
Haryana	19.4	45.7	-1.8	5.0	19.1	1.4	-1.0	14.2	39.6	0.2	-1.7
Himachal Pradesh	16.0	38.6	-1.5	5.5	19.3	1.1	-1.0	11.4	36.5	0.5	-1.6
Jammu & Kashmir	14.9	35.0	-1.3	4.4	14.8	2.3	-0.7	8.2	25.6	0.5	-1.3
Punjab	17.3	36.7	-1.5	2.1	9.2	1.5	-0.5	8.0	24.9	0.5	-1.2
Rajasthan	22.7	43.7	-1.7	7.3	20.4	1.6	-1.1	15.3	39.9	0.4	-1.7
Uttaranchal	23.1	44.4	-1.8	5.3	18.8	2.3	-0.9	15.7	38.0	0.3	-1.7
Central											
Chhattisgarh	24.8	52.9	-2.0	5.6	19.5	1.3	-1.1	16.4	47.1	0.0	-1.9
Madhya Pradesh	26.3	50.0	-2.0	12.6	35.0	1.0	-1.6	27.3	60.0	0.1	-2.3
Uttar Pradesh	32.4	56.8	-2.2	5.1	14.8	1.2	-0.8	16.4	42.4	0.1	-1.8
East											
Bihar	29.1	55.6	-2.1	8.3	27.1	0.3	-1.4	24.1	55.9	0.1	-2.2
Jharkhand	26.8	49.8	-1.9	11.8	32.3	0.6	-1.5	26.1	56.5	0.2	-2.2
Orissa	19.6	45.0	-1.7	5.2	19.5	1.7	-1.0	13.4	40.7	0.5	-1.7
West Bengal	17.8	44.6	-1.7	4.5	16.9	1.9	-0.9	11.1	38.7	0.5	-1.6
Northeast											
Arunachal Pradesh	21.7	43.3	-1.6	6.1	15.3	3.4	-0.7	11.1	32.5	0.6	-1.4
Assam	20.9	46.5	-1.8	4.0	13.7	1.2	-0.8	11.4	36.4	0.3	-1.6
Manipur	13.1	35.6	-1.4	2.1	9.0	2.2	-0.6	4.7	22.1	0.5	-1.2
Meghalaya	29.8	55.1	-2.0	19.9	30.7	2.6	-1.2	27.7	48.8	0.2	-2.0
Mizoram	17.7	39.8	-1.6	3.5	9.0	4.3	-0.3	5.4	19.9	1.2	-1.1
Nagaland	19.3	38.8	-1.4	5.2	13.3	4.7	-0.5	7.1	25.2	0.8	-1.2
Sikkim	17.9	38.3	-1.4	3.3	9.7	8.3	-0.1	4.9	19.7	1.3	-0.9
Tripura	14.7	35.7	-1.5	8.6	24.6	2.2	-1.2	15.7	39.6	0.1	-1.7
West											
Goa	10.2	25.6	-1.1	5.6	14.1	4.3	-0.7	6.7	25.0	1.9	-1.1
Gujarat	25.5	51.7	-2.0	5.8	18.7	1.2	-1.0	16.3	44.6	0.1	-1.8
Maharashtra	19.1	46.3	-1.8	5.2	16.5	2.8	-0.9	11.9	37.0	0.9	-1.6
South											
Andhra Pradesh	18.7	42.7	-1.7	3.5	12.2	2.2	-0.7	9.9	32.5	0.6	-1.5
Karnataka	20.5	43.7	-1.7	5.9	17.6	2.6	-1.0	12.8	37.6	0.5	-1.6
Kerala	6.5	24.5	-1.1	4.1	15.9	1.2	-0.9	4.7	22.9	0.4	-1.2
Tamil Nadu	10.9	30.9	-1.1	8.9	22.2	3.6	-1.0	6.4	29.8	1.9	-1.3

Note: Table is based on children who stayed in the household the night before the interview. Each of the indices is expressed in standard deviation units (SD) from the median of the 2006 WHO International Reference Population. Table is based on children with valid dates of birth (month and year) and valid measurements of both height and weight.

[1] Includes children who are below -3 standard deviations (SD) from the International Reference Population median.

4.3 THE STATUS OF BREASTFEEDING AND SUPPLEMENTATION

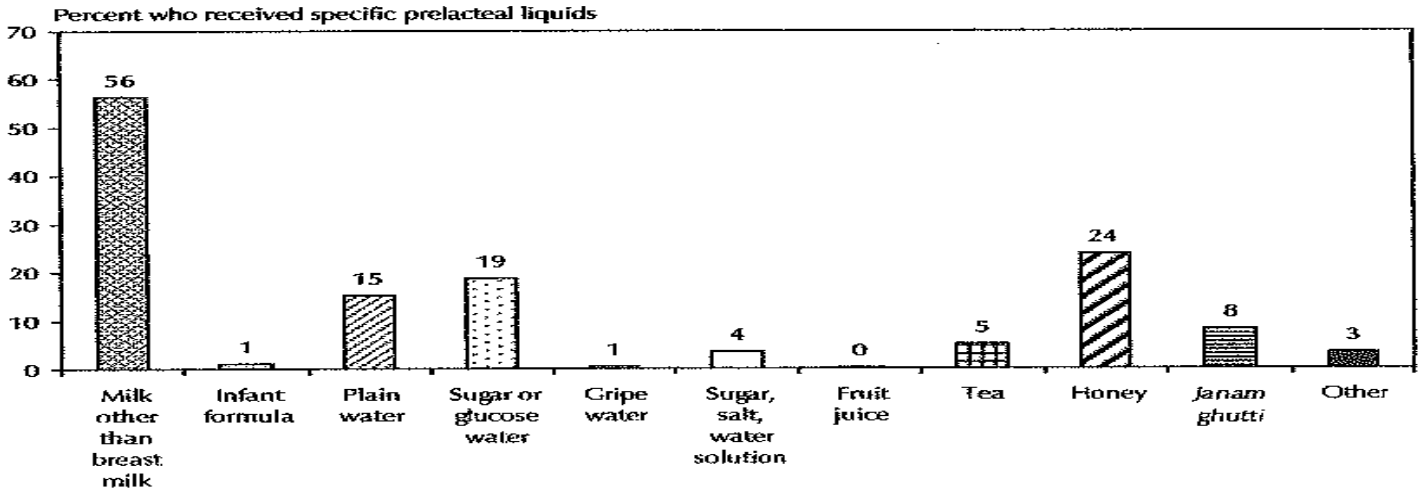
As it is well known, infant feeding practices have significant effects on both mothers and children. In fact, proper infant feeding from the very time of birth is important for the physical and mental development of children. Breastfeeding improves the nutritional status of young children and reduces morbidity and mortality. Moreover, it not only provides important nutrients but also protects the child against infections. The timing and type of supplementary foods introduced in an infant's diet also have significant effects on the child's nutritional status.

The Government of India recommends that initiation of breastfeeding should begin immediately after childbirth, preferably within one hour (Ministry of Women and Child Development, 2006). Early initiation of breastfeeding is encouraged for a number of reasons. First of all, the first breast milk (colostrum) is highly nutritious and has antibodies that protect the newborn from diseases. Late initiation of breastfeeding not only deprives the child of valuable colostrum, but becomes a reason for introduction of prelacteal feeds (that is, something other than breast milk) like glucose water, honey, ghutti, animal milk, or powdered milk that are potentially harmful and contribute to diarrhoea in the newborn.

In NFHS-3, data on breastfeeding and complementary feeding were obtained from a series of questions in the Women's Questionnaire. These questions were asked for all children born since January of the fifth calendar year before the survey, but the tables are restricted to children born in the five years preceding the survey. Tables C and D show the percentage of children born during the five years before the survey who were ever breastfed and who started breastfeeding soon after birth and the percentage of children who were given an alternative prelacteal feed during the first three days after delivery. The NFHS-3 demonstrates that, although breastfeeding is nearly universal in India, very few children are put to the breast immediately after birth. Ninety-six percent of children under age five have ever been breastfed, but only one-quarter of new-born children who were ever breastfed started breastfeeding within one hour of birth, as is recommended (Table C). Almost half (45 percent) did not start breastfeeding within one day of birth. Most mothers (57 percent) gave their last-born child something to drink other than breast milk in the three days after delivery. Prelacteal feeds were more common in rural areas than in urban areas, and among women with no education. According to what was discovered by the NFHS-3, the most common prelacteal liquid is milk other than breast milk (Figure A) Other common prelacteal liquids are honey (often given as part of a blessing ceremony), sugar or glucose water, and plain water.

Figure A

Figure 10.3 Prelacteal Liquids



Note: Based on last-born children under age 5 years who received a prelacteal feed

NFHS-3, India, 2005-06

Table 10.4 Initial breastfeeding

Percentage of children born in the five years preceding the survey who were ever breastfed, and for last-born children born in the five years preceding the survey who were ever breastfed, percentage who started breastfeeding within half an hour, one hour, and one day of birth and percentage who received a prelacteal feed, by background characteristics, India, 2005-06

Background characteristic	Percentage ever breastfed	Number of children	Percentage who started breastfeeding: Within half an hour of birth	Within one hour of birth[1]	Within one day of birth[2]	Percentage who received a prelacteal feed[3]	Number of last-born ever breastfed children
Residence							
Urban	96.0	14,303	29.4	30.3	64.5	50.2	10,333
Rural	95.7	42,135	21.4	22.4	51.9	59.8	28,255
Sex							
Male	95.6	29,415	23.7	24.7	55.5	57.3	20,775
Female	95.9	27,022	23.4	24.3	55.0	57.0	17,813
Mother's education							
No education	95.5	28,237	15.9	16.7	43.1	67.5	18,251
<5 years complete	95.4	4,100	27.6	28.6	61.4	51.7	2,791
5-7 years complete	96.0	8,189	27.0	27.9	61.8	51.4	5,690
8-9 years complete	95.8	6,723	31.6	32.8	67.7	46.9	4,773
10-11 years complete	96.0	4,282	33.3	34.4	69.8	45.7	3,166
12 or more years complete	96.7	4,905	33.5	34.6	71.6	43.4	3,915
Religion							
Hindu	95.7	44,152	23.4	24.4	55.0	57.2	30,434
Muslim	96.1	9,641	21.3	21.7	52.6	62.4	6,325
Christian	95.9	1,109	48.7	49.5	82.5	25.7	790
Sikh	93.3	716	12.3	13.1	49.6	61.9	483
Buddhist/Neo-Buddhist	94.2	377	49.9	50.9	79.5	25.1	245
Jain	100.0	87	22.5	23.1	74.0	38.5	76
Other	95.5	306	18.9	19.6	60.5	46.1	198
Caste/tribe							
Scheduled caste	95.3	11,693	21.9	23.2	51.8	59.1	7,709
Scheduled tribe	96.6	5,442	27.8	28.5	62.6	43.2	3,671
Other backward class	95.9	22,716	21.1	21.9	50.2	62.7	15,471
Other	95.5	16,176	26.3	27.2	61.9	53.5	11,432
Don't know	97.9	220	31.4	32.1	67.9	45.2	158
Assistance at delivery							
Health personnel[4]	95.7	26,293	31.0	32.1	68.1	45.7	19,150
Dai (TBA)	95.7	20,618	14.7	15.4	43.4	69.2	13,331
Other/no one	96.0	9,449	19.7	20.5	41.4	67.3	6,087
Place of delivery							
Health facility	95.5	21,570	33.0	34.0	71.3	42.6	15,746
At home	95.9	34,461	16.9	17.8	44.1	67.5	22,578
Other	93.6	340	30.9	31.4	65.7	47.7	249
Wealth index							
Lowest	96.0	14,377	17.2	17.9	45.3	64.9	9,321
Second	95.2	12,654	19.7	20.6	47.1	63.3	8,348
Middle	95.6	11,181	25.6	26.4	57.1	55.4	7,579
Fourth	95.9	10,154	27.7	29.0	64.4	51.0	7,052
Highest	96.1	8,072	31.0	32.1	68.7	46.9	6,288
Total	95.7	56,438	23.6	24.5	55.3	57.2	38,588

Note: Table is based on children born in the last five years whether the children are living or dead at the time of interview. Total includes children with missing information on mother's education, religion, caste/tribe, assistance at delivery, and place of delivery, who are not shown separately.
TBA = Traditional birth attendant
[1] Includes children who started breastfeeding within half an hour of birth.
[2] Includes children who started breastfeeding within half an hour and one hour of birth.
[3] Children given something other than breast milk during the first three days of life.
[4] Doctor, nurse, midwife, auxiliary nurse midwife, lady health visitor, or other health personnel.

Table D

Table 10.5 Initial breastfeeding by state

Percentage of children born in the five years preceding the survey who were ever breastfed, and for last-born children born in the five years preceding the survey who were ever breastfed, percentage who started breastfeeding within half an hour, one hour, and one day of birth and percentage who received a prelacteal feed, according to state, India, 2005-06

State	Percentage ever breastfed	Among last-born children born in the last 5 years who were ever breastfed: Percentage who started breastfeeding: Within half an hour of birth	Within one hour of birth[1]	Within one day of birth[2]	Percentage who received a prelacteal feed[3]
India	95.7	23.6	24.5	55.3	57.2
North					
Delhi	95.6	21.0	21.0	67.9	45.5
Haryana	95.8	19.2	22.1	63.0	53.9
Himachal Pradesh	92.3	44.1	45.4	77.6	21.7
Jammu & Kashmir	95.2	31.5	31.6	72.3	36.6
Punjab	94.1	11.4	12.7	44.5	62.9
Rajasthan	96.0	13.7	14.1	54.0	71.6
Uttaranchal	90.1	30.0	33.5	71.0	44.9
Central					
Chhattisgarh	96.3	22.7	25.0	63.6	23.3
Madhya Pradesh	95.7	14.7	15.9	52.6	58.1
Uttar Pradesh	96.0	7.2	7.3	23.7	86.0
East					
Bihar	94.4	2.8	3.7	30.0	90.6
Jharkhand	95.4	10.3	10.7	45.1	66.3
Orissa	94.6	50.7	54.8	82.3	42.1
West Bengal	96.2	22.5	23.5	72.9	47.8
Northeast					
Arunachal Pradesh	95.5	58.1	58.6	87.0	16.7
Assam	96.4	49.5	50.9	74.7	32.7
Manipur	96.0	57.4	57.8	79.8	37.5
Meghalaya	96.5	57.2	57.8	90.8	31.2
Mizoram	98.0	66.1	66.4	90.6	23.3
Nagaland	96.1	54.1	54.2	82.9	53.8
Sikkim	98.1	42.7	42.9	88.4	12.3
Tripura	97.1	33.7	34.6	77.1	36.4
West					
Goa	96.7	59.1	59.4	82.0	38.3
Gujarat	96.8	25.2	27.8	58.0	57.3
Maharashtra	97.1	51.5	52.0	78.4	32.2
South					
Andhra Pradesh	95.5	24.4	24.6	58.1	42.7
Karnataka	96.3	35.1	35.7	74.6	29.2
Kerala	97.4	56.1	56.5	95.7	10.8
Tamil Nadu	94.5	57.7	58.8	91.0	20.6

Note: Table is based on births in the last five years whether the children are living or dead at the time of interview.
[1] Includes children who started breastfeeding within half an hour of birth.
[2] Includes children who started breastfeeding within half an hour and one hour of birth.
[3] Children given something other than breast milk during the first three days of life.

4.3.1 BREASTFEEDING STATUS BY AGE

The Government of India following the guidelines of the WHO recommends that children should be exclusively breastfed for the first six months of life and that children should be given appropriate and adequate complementary feeding in addition to continued breastfeeding from six months of age (Ministry of Women and Child Development, 2006). Exclusive breastfeeding is recommended because breast milk is uncontaminated and contains all the nutrients necessary for children in the first few months of life. In addition, the mother's antibodies in breast milk give the child considerable immunity to diseases. There are many reasons why early supplementation is discouraged:

Supplementation exposes infants to pathogens and increases their risk of infection and disease. Second,

1) It decreases infants' intake of breast milk thus reducing suckling and consequently breast milk production.

2) In a harsh socioeconomic environment, supplementary food is often nutritionally inferior. The purpose of complementary feeding is to complement the breast milk and sustain the growth and development of the child. Information on supplementation was obtained by asking mothers about the current breastfeeding status of all children under five years of age and, for the youngest child born in the three-year period before the survey and living with the mother, about food (liquids or solids) given to the child the day before the survey. Results concerning breastfeeding colected by NFHS-3 are shown in Table E.

Table E

Table 10.6 Breastfeeding status by age

Percent distribution of youngest children under three years living with the mother by breastfeeding status and percentage of all children under three years using a bottle with a nipple, according to age in months, India, 2005-06

			Breastfeeding and consuming:							
Age in months	Not breast-feeding	Exclusively breastfed	Plain water only	Non-milk liquids/ juice	Other milk	Comple-mentary foods	Total	Number of youngest children under three years	Percentage using a bottle with a nipple[1]	Number of children
<2	2.7	69.0	16.2	2.6	7.8	1.7	100.0	1,268	5.4	1,276
2-3	1.5	50.9	23.1	4.9	14.6	5.0	100.0	1,848	13.3	1,864
4-5	1.5	27.6	25.6	6.4	20.2	18.6	100.0	1,966	16.4	1,987
6-8	4.0	9.7	18.8	3.2	11.6	52.7	100.0	2,918	17.0	2,933
9-11	6.2	2.9	9.8	1.7	5.7	73.6	100.0	2,324	18.2	2,343
12-17	12.5	0.7	2.7	1.2	1.7	81.3	100.0	5,077	14.6	5,211
18-23	23.2	0.2	1.3	0.6	0.8	74.0	100.0	4,748	12.5	5,208
24-35	45.5	0.3	0.3	0.1	0.3	53.6	100.0	7,657	8.3	10,383
<4	2.0	58.3	20.3	4.0	11.8	3.7	100.0	3,115	10.1	3,140
<6	1.8	46.4	22.4	4.9	15.0	9.5	100.0	5,081	12.5	5,127
6-9	4.2	8.2	17.2	3.1	10.6	56.7	100.0	3,803	17.2	3,822
12-23	17.7	0.4	2.0	0.9	1.3	77.8	100.0	9,825	13.6	10,419

Note: Breastfeeding status refers to a "24-hour" period (yesterday and last night). Children who are classified as *breastfeeding and consuming plain water only* consumed no liquid or solid supplements. The categories of not breastfeeding, exclusively breastfed, breastfeeding and consuming plain water, non-milk liquids/juice, other milk, and complementary foods (solids and semi-solids) are hierarchical and mutually exclusive, and their percentages add to 100 percent. Thus any children who get complementary food are classified in that category as long as they are breastfeeding as well. Children who receive breast milk and non-milk liquids and who do not receive complementary foods are classified in the non-milk liquid category even though they may also get plain water.
[1] Based on all children under three years.

The table shows the percent distribution of youngest children less than three years of age living with the mother by breastfeeding status and the percentage of all

children under three years of age using a bottle with a nipple, according to age in months. Children who received nothing but breast milk during the previous day or night are classified as being exclusively breastfed. Only 69 percent of children under two months of age are exclusively breastfed. Exclusive breastfeeding drops to 51 percent at 2-3 months of age and 28 percent at 4-5 months of age. Overall, slightly less than half of children under six months of age are exclusively breastfed. Twenty-two percent of children under six months of age received only breast milk and plain water and 15 percent drank both breast milk and other milk. At age 6-8 months, only about half of children (53 percent) are given timely complementary feeding (breast milk and complementary food). The timely complementary feeding rate increases to 74 percent at age 9-11 months and 81 percent at age 12-17 months. Furthermore, since it is often difficult to sterilize the nipple properly, the use of bottles with nipples also exposes children to an increased risk of getting diarrhoea and other diseases. However, the NFHS-3 reports that, in India, the use of bottles with nipples is not common. Bottle feeding increases from 5 percent under age two months to 18 percent at age 9-11 months and declines at older ages.

4.3.2 DURATION AND FREQUENCY OF BREASTFEEDING

Both duration and frequency of breastfeeding can affect the length of postpartum amenorrhoea. It is important that breastfeeding is continued for two years or more because breast milk provides useful amounts of energy, good quality protein, and other nutrients. Table F shows the median duration of breastfeeding for last-born children born in the three years preceding the NFHS-3 survey by background characteristics. The median duration of any breastfeeding is 24 months. Supplementation begins relatively early, however. The median length of exclusive breastfeeding is only 2 months and the median length of predominant breastfeeding (that is, breastfeeding plus receiving plain water and/or non-milk liquids only) is 5 months.

Table 10.7 Median duration and frequency of breastfeeding

Median duration of any breastfeeding, exclusive breastfeeding, and predominant breastfeeding among last-born children born in the three years preceding the survey, percentage of breastfeeding children under six months of age living with the mother who were breastfed six or more times in the 24 hours preceding the survey, and mean number of feeds (day/night), by background characteristics, India, 2005-06

Background characteristic	Median duration (months) of breastfeeding among last-born children born in the last three years[1]				Frequency of breastfeeding among children under six months[2]			
	Any breast-feeding	Exclusive breast-feeding	Predomi-nant breast-feeding[3]	Number of children	Percentage breastfed 6+ times in last 24 hours	Mean number of day feeds	Mean number of night feeds	Number of children
Sex								
Male	25.4	2.1	5.1	17,335	96.7	6.7	5.6	2,462
Female	23.6	1.9	5.1	15,780	96.7	6.6	5.4	2,500
Residence								
Urban	22.0	1.7	4.2	8,357	95.9	6.5	5.3	1,188
Rural	25.7	2.1	5.4	24,757	97.0	6.7	5.5	3,774
Mother's education								
No education	26.5	2.0	5.9	15,989	96.6	6.5	5.3	2,366
<5 years complete	25.3	2.8	5.9	2,285	96.1	7.4	5.7	354
5-7 years complete	24.1	1.8	4.9	4,977	97.1	6.6	5.6	752
8-9 years complete	23.0	2.0	4.6	4,145	97.9	6.9	5.9	653
10-11 years complete	22.4	1.9	3.7	2,635	97.1	6.7	5.5	375
12 or more years complete	20.6	1.8	3.4	3,082	95.2	6.4	5.4	462
Religion								
Hindu	24.9	2.0	5.1	25,925	96.7	6.7	5.5	3,912
Muslim	23.8	2.0	5.3	5,616	97.5	6.6	5.3	837
Christian	21.8	2.6	4.4	663	98.4	6.8	6.3	90
Sikh	21.9	0.6	2.7	428	91.0	6.1	5.3	57
Buddhist/Neo-Buddhist	24.8	1.4	7.7	230	92.8	6.1	5.5	32
Jain	15.6	2.0	2.0	53	*	*	*	3
Other	0.0	2.0	6.1	167	94.3	7.7	5.6	26
Caste/tribe								
Scheduled caste	26.3	2.4	5.3	6,807	96.8	6.5	5.4	1,026
Scheduled tribe	26.1	2.9	6.2	3,161	96.1	6.8	5.6	502
Other backward class	23.9	1.7	5.2	13,366	97.2	6.6	5.3	2,042
Other	23.8	1.9	4.3	9,549	96.0	6.8	5.6	1,353
Wealth index								
Lowest	27.7	2.5	6.3	8,331	97.5	6.9	5.5	1,279
Second	25.8	2.3	5.5	7,432	97.0	7.0	5.8	1,143
Middle	25.0	1.8	5.2	6,518	96.5	6.4	5.3	1,007
Fourth	22.8	1.6	4.4	6,032	97.0	6.3	5.4	878
Highest	20.8	1.4	3.3	4,802	94.6	6.5	5.3	654
Total	24.4	2.0	5.1	33,114	96.7	6.6	5.5	4,962
Mean for all children	24.7	3.7	6.4	na	na	na	na	na

Note: Median and mean durations are based on current status. Table includes children living and deceased at the time of the survey. Total includes children whose mothers do not know their caste/tribe, and children with missing information on mother's education, religion, and caste/tribe, which are not shown separately.
na = Not applicable
* Figure not shown; based on fewer than 25 unweighted cases.
[1] It is assumed that children not currently living with the mother are not currently breastfeeding.
[2] Excludes children for whom there is not a valid answer on the number of times breastfed. The 24-hour period refers to the day and night preceding the survey.
[3] Either exclusively breastfed or received breast milk and plain water and/or non-milk liquids only.

The median duration of breastfeeding is two months shorter for girls than for boys. The duration of breastfeeding is also shorter in urban areas, and it decreases steadily with the mother's education and the wealth index. The duration of breastfeeding is relatively high for children from scheduled castes and scheduled tribes. The median duration of breastfeeding is 20 months or more in every state except Tamil Nadu (16 months) and Nagaland (19 months). The longest median durations (more than 32 months) are in Orissa, Jharkhand, Manipur, West Bengal, Tripura, and Assam. Chhattisgarh has the longest median duration of exclusive breastfeeding.

4.3.3 TYPES OF SUPPLEMENTARY FOOD

The WHO recommends the introduction of solid or semi-solid food to infants around the age of six months because by that age breast milk by itself is no longer sufficient to maintain a child's optimal growth. The percentage of breastfeeding children receiving solid or semisolid food increases with the age of the child. In India the largest increase is from 19 percent at age 4-5 months to 55 percent at 6-8 months. This rapid increase is consistent with the recommendation that solid or semi-solid food should be introduced around six months of age. Nevertheless, it is disconcerting to note that even at 6-8 months of age, almost half of breastfeeding children are not given any solid or semi-solid food. The most common types of solid or semi-solid foods fed to both breastfeeding and nonbreastfeeding children under three years of age are foods made from grains (including bread, roti, chapati, rice, noodles, biscuits, and idli), fruits and vegetables rich in vitamin A, and food made from roots (not including root foods that are yellow or orange inside). However, only onethird of breastfeeding children and half of nonbreastfeeding children age 6-23 months ate fruits and vegetables that are rich in vitamin A during the day or night before the survey. Only 10 percent of breastfeeding children and 20 percent of nonbreastfeeding children under three years of age consume meat, fish, poultry, or eggs. Milk products, such as cheese and yogurt, are even less likely to be given to young children, and foods made with oil, fat, ghee, or butter, are also not commonly given to young children. As expected, every type of solid or semi-solid food is more likely to be consumed by nonbreastfeeding children than breastfeeding children.

4.4 INFANT AND YOUNG CHILD FEEDING PRACTICES

Table G and H and Figure B provide information collected by the NFHS-3 about adherence to appropriate feeding percentage of children calculated on the basis of the number of food groups and the number of times the children were fed during the day or night preceding the survey.

Table G

Table 10.10 Infant and young child feeding (IYCF) practices

Percentage of youngest children age 6-23 months living with the mother who are fed with appropriate feeding practices based upon number of food groups and times they are fed during the day or night preceding the survey by breastfeeding status and background characteristics, India, 2005-06

	Among breastfed children 6-23 months, percentage fed:				Among nonbreastfed children 6-23 months, percentage fed:					Among all children 6-23 months, percentage fed:				
Background characteristic	Three or more food groups[1]	Minimum number of times[2]	3+ food groups and minimum number of times	Number of children	Milk or milk products[3]	Four or more food groups[1]	Four or more times	With 3 IYCF practices[4]	Number of children	Breast milk, milk, or milk products[3]	Appropriate number of food groups[5]	Minimum times[6]	With 3 IYCF practices	Number of children
Age in months														
6-8	10.3	40.7	9.2	2,801	88.4	6.0	21.6	5.4	117	99.5	10.1	39.9	9.0	2,918
9-11	26.0	28.8	13.5	2,178	91.3	20.0	15.6	5.0	145	99.5	25.6	28.0	13.0	2,324
12-17	44.5	45.1	25.6	4,444	88.5	31.1	26.1	13.3	633	98.6	42.9	42.7	24.0	5,077
18-23	51.3	53.3	32.9	3,646	75.8	35.2	28.9	12.7	1,102	94.4	47.5	47.6	28.2	4,748
Sex														
Male	36.2	43.2	21.8	6,944	81.5	33.3	28.7	13.5	1,036	97.6	35.8	41.3	20.7	7,979
Female	35.8	44.3	22.4	6,126	82.0	28.8	24.4	10.1	961	97.6	34.8	41.6	20.8	7,087
Residence														
Urban	42.1	48.4	27.2	3,024	85.4	35.1	25.3	13.7	833	96.8	40.6	43.4	24.3	3,857
Rural	34.1	42.3	20.6	10,046	79.1	28.3	27.5	10.5	1,163	97.8	33.5	40.8	19.5	11,209
Mother's education														
No education	28.5	40.3	17.2	6,417	71.4	19.9	23.0	6.1	671	97.3	27.7	38.7	16.2	7,088
<5 years complete	36.3	42.0	22.8	907	83.8	30.4	23.4	10.5	115	98.2	35.6	39.9	21.4	1,022
5-7 years complete	38.7	42.7	22.4	2,050	81.5	30.1	29.1	12.7	252	98.0	37.7	41.2	21.3	2,302
8-9 years complete	42.4	47.2	26.1	1,555	83.5	38.4	27.2	15.5	311	97.2	41.8	43.9	24.4	1,866
10-11 years complete	47.8	50.6	29.6	1,002	89.4	35.9	27.5	12.6	233	98.0	45.6	46.3	26.4	1,235
12 or more years complete	53.7	55.3	36.4	1,137	92.2	41.8	30.9	18.0	416	97.9	50.5	48.8	31.5	1,553
Religion														
Hindu	36.1	43.7	22.1	10,239	82.9	31.1	28.0	12.7	1,498	97.8	35.5	41.7	20.9	11,737
Muslim	34.8	42.8	21.0	2,206	77.5	29.2	21.2	8.3	372	96.8	34.0	39.7	19.2	2,578
Christian	44.9	60.9	34.9	255	74.3	39.9	32.7	12.3	66	94.7	43.9	55.1	30.2	321
Sikh	42.2	31.0	22.9	157	94.4	36.7	19.8	15.4	40	98.9	41.1	28.8	21.4	197
Buddhist/Neo-Buddhist	20.6	41.1	15.2	100	61.1	41.3	3.7	2.2	7	97.6	21.9	38.8	14.4	106
Jain	61.1	53.2	41.0	16	100.0	33.1	19.8	18.3	10	100.0	50.4	40.4	32.3	26
Other	25.9	49.6	19.3	82	9.6	6.9	41.2	1.3	5	94.6	24.7	49.1	18.3	87
Caste/tribe														
Scheduled caste	33.2	43.0	19.6	2,768	76.3	30.0	29.5	11.7	324	97.5	32.9	41.6	18.8	3,092
Scheduled tribe	23.9	42.4	14.3	1,335	50.2	26.3	34.3	10.9	127	95.7	24.1	41.7	14.0	1,462
Other backward class	37.0	44.2	23.4	5,154	84.7	31.0	27.3	12.0	796	97.9	36.2	42.0	21.9	5,950
Other	40.8	44.0	24.9	3,720	86.0	32.4	23.7	12.3	735	97.7	39.4	40.7	22.8	4,455
Don't know	48.5	42.1	24.2	49	*	*	*	*	12	98.1	48.8	35.9	19.6	61
Wealth index														
Lowest	26.8	41.4	16.3	3,448	63.7	25.4	26.8	10.5	275	97.3	26.7	40.4	15.9	3,723
Second	33.6	41.7	20.6	3,042	71.5	24.6	25.3	8.3	298	97.5	32.8	40.3	19.5	3,340
Middle	37.1	41.3	21.5	2,573	81.4	28.5	27.2	10.9	347	97.8	36.1	39.7	20.2	2,920
Fourth	40.1	45.1	24.6	2,307	86.0	31.5	22.5	9.8	446	97.7	38.7	41.4	22.2	2,753
Highest	51.5	53.7	33.9	1,699	91.4	37.8	29.7	16.2	631	97.7	47.8	47.2	29.1	2,330
Total	36.0	43.7	22.1	13,069	81.7	31.1	26.6	11.9	1,997	97.6	35.3	41.5	20.7	15,066

Note: Total includes children with missing information on mother's education, religion, and caste/tribe, who are not shown separately.
* Percentage not shown; based on fewer than 25 unweighted cases.
[1] Food groups are:
a. infant formula, milk other than breast milk, cheese or yogurt or other milk products; b. foods made from grains or roots, including porridge or gruel, fortified baby food; c. vitamin A-rich fruits and vegetables; d. other fruits and vegetables; e. eggs; f. meat, poultry, fish, shellfish, or organ meats; g. beans, peas, lentils, or nuts; h. foods made with oil, fat, *ghee*, or butter.
[2] At least twice a day for breastfed infants 6-8 months and at least three times a day for breastfed children 9-23 months.
[3] Commercially produced infant formula; tinned, powdered, or fresh animal milk; cheese; yogurt; or other milk products.
[4] Non-breastfed children ages 6-23 months are considered to be fed with three IYCF practices if they receive milk or milk products and are fed at least the minimum number of times per day with at least the minimum number of food groups.
[5] Three or more food groups for breastfed children and four or more food groups for non-breastfed children.
[6] Fed solid or semi-solid food at least twice a day for infants 6-8 months, 3 or more times for other breastfed children, and 4 or more times for non-breastfed children.

Table H

Table 10.11 Infant and young child feeding (IYCF) practices by state

Percentage of youngest children age 6-23 months living with the mother who are fed with appropriate feeding practices based upon number of food groups and times they are fed during the day or night preceding the survey, according to state, India, 2005-06

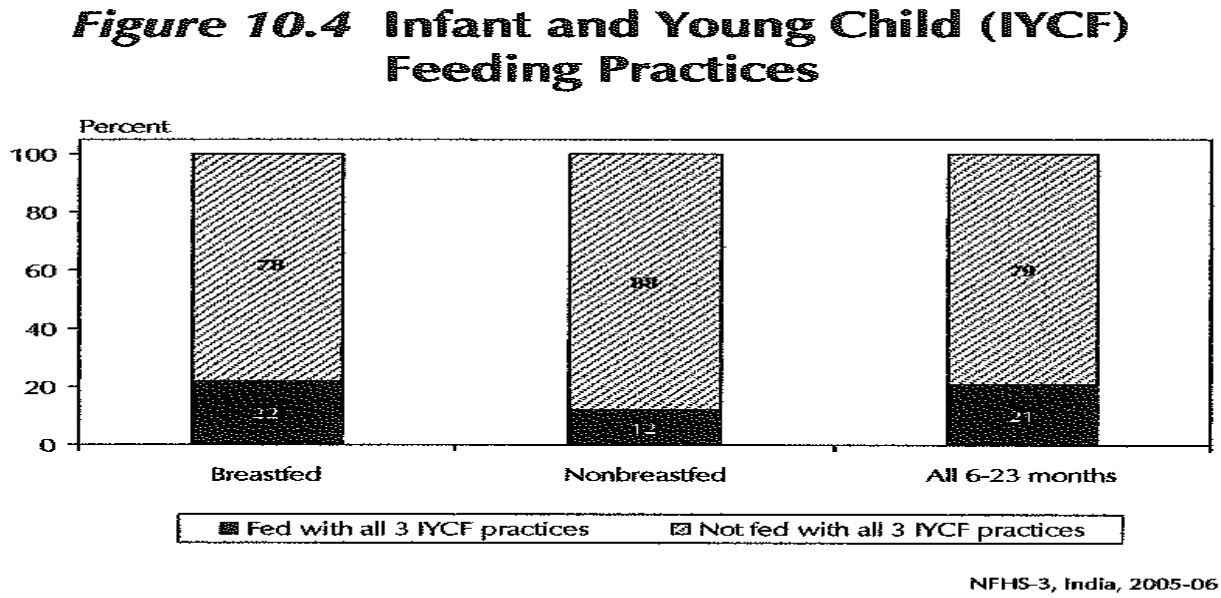
State	Among breastfed children 6-23 months, percentage fed:			Among nonbreastfed children 6-23 months, percentage fed:				Among all children 6-23 months, percentage fed:			
	Three or more food groups[1]	Minimum number of times[2]	3+ food groups and minimum number of times	Milk or milk products[3]	Four or more food groups[1]	Four or more times	With 3 IYCF practices[4]	Breast milk, milk, or milk products[3]	Appropriate number of food groups[5]	Minimum times[6]	With 3 IYCF practices
India	36.0	43.7	22.1	81.7	31.1	26.6	11.9	97.6	35.3	41.5	20.7
North											
Delhi	51.5	58.1	39.5	87.4	38.1	43.5	17.8	96.9	48.2	54.5	34.2
Haryana	31.3	35.0	18.8	85.3	23.2	22.3	6.4	97.3	29.8	32.7	16.5
Himachal Pradesh	69.2	49.0	41.2	91.6	55.8	34.3	33.5	98.5	66.9	46.4	39.8
Jammu & Kashmir	46.8	40.4	27.6	93.7	46.8	26.0	18.9	98.9	46.8	37.9	26.1
Punjab	39.9	32.7	21.2	94.5	32.3	23.9	15.5	98.8	38.3	30.7	19.9
Rajasthan	20.8	38.7	15.7	92.2	15.3	28.3	6.6	99.0	20.1	37.4	14.6
Uttaranchal	47.9	40.4	27.6	89.7	49.5	33.9	16.8	98.3	48.2	39.3	25.9
Central											
Chhattisgarh	34.2	53.2	27.2	*	*	*	*	98.1	34.1	51.9	26.5
Madhya Pradesh	23.5	45.7	18.0	75.5	23.5	42.7	18.3	97.4	23.5	45.4	18.1
Uttar Pradesh	36.1	35.2	18.7	83.6	30.9	16.7	8.2	98.0	35.4	33.0	17.4
East											
Bihar	34.9	54.8	24.3	78.0	20.9	41.1	11.9	97.9	33.6	53.5	23.1
Jharkhand	28.5	44.3	18.0	(71.9)	(21.4)	(26.7)	(5.1)	97.8	27.9	43.0	17.0
Orissa	44.9	56.3	30.6	(77.9)	(33.9)	(45.9)	(19.9)	98.7	44.2	55.7	30.0
West Bengal	58.7	40.1	29.5	81.9	62.1	16.3	12.2	98.9	58.9	38.6	28.5
Northeast											
Arunachal Pradesh	33.8	63.9	28.4	*	*	*	*	97.8	33.9	63.0	27.9
Assam	32.7	41.1	16.4	*	*	*	*	98.8	32.1	40.8	16.1
Manipur	55.3	66.1	42.9	(53.6)	(47.9)	(34.1)	(15.0)	96.1	54.6	63.4	40.5
Meghalaya	35.3	43.9	22.7	50.1	34.8	35.8	6.6	90.2	35.2	42.3	19.5
Mizoram	35.0	56.1	20.9	(59.9)	(38.8)	(33.0)	(21.3)	93.7	35.6	52.5	20.9
Nagaland	27.7	63.9	22.6	60.6	35.2	44.7	21.1	90.5	29.5	59.3	22.2
Sikkim	70.1	66.2	51.1	*	*	*	*	100.0	70.6	63.7	49.4
Tripura	56.8	46.2	31.1	*	*	*	*	99.4	56.3	43.3	29.4
West											
Goa	65.2	61.5	48.3	95.4	62.6	43.4	32.5	98.6	64.3	55.8	43.3
Gujarat	35.3	44.7	23.8	87.9	25.5	26.7	5.4	97.8	33.5	41.5	20.5
Maharashtra	20.4	35.9	11.9	71.6	20.8	23.3	7.8	95.8	20.5	34.1	11.3
South											
Andhra Pradesh	29.1	29.7	12.2	78.0	17.0	5.9	2.0	95.7	26.7	25.1	10.2
Karnataka	42.2	48.4	25.0	82.0	49.2	22.8	18.2	96.1	43.7	42.9	23.5
Kerala	73.6	79.7	62.2	(86.7)	(76.7)	(76.7)	(50.0)	98.7	73.9	79.4	61.0
Tamil Nadu	47.6	62.7	33.7	86.8	43.6	35.5	19.9	95.4	46.2	53.1	28.9

( ) Based on 25-49 unweighted cases.
* Percentage not shown; based on fewer than 25 unweighted cases.
[1] Food groups are: a. infant formula, milk other than breast milk, cheese or yogurt or other milk products; b. foods made from grains or roots, including porridge or gruel, fortified baby food; c. vitamin A-rich fruits and vegetables; d. other fruits and vegetables; e. eggs; f. meat, poultry, fish, shellfish, or organ meats; g. beans, peas, lentils, or nuts; h. foods made with oil, fat, ghee, or butter.
[2] At least twice a day for breastfed infants 6-8 months and at least three times a day for breastfed children 9-23 months.
[3] Commercially produced infant formula; tinned, powdered, or fresh animal milk; cheese; yogurt; or other milk products.
[4] Non-breastfed children ages 6-23 months are considered to be fed with three IYCF practices if they receive milk or milk products and are fed at least the minimum number of times per day with at least the minimum number of food groups.
[5] Three or more food groups for breastfed children and four or more food groups for non-breastfed children.
[6] Fed solid or semi-solid food at least twice a day for infants 6-8 months, 3 or more times for other breastfed children, and 4 or more times for non-breastfed children.

The results are shown separately for children who are breastfed and children who are not breastfed because appropriate feeding practices are different for these two groups. It is recommended that breastfeeding children age 6-23 months should be fed from three or more different food groups. Moreover, infants age 6-8 months should be fed at least twice a day and children age 9-23 months should be fed at least three times a day. Nonbreastfeeding children

age 6-23 months should be fed milk or milk products every day; in addition, they should be fed from at least four food groups and they should be fed four or more times a day. Table 10.10 shows that only 44 percent of breastfed children are fed at least the minimum number of times recommended, but only half of them also consume food from three or more food groups. Feeding recommendations are even less likely to be followed for nonbreastfeeding children age 6-23 months. More than four out of five children in this group were given milk or milk products the day before the survey, but only 31 percent consumed food from four or more food groups, as recommended. Even fewer children (27 percent) are fed four or more times a day. Only 12 percent of nonbreastfed children are fed with all three infant and young child feeding (IYCF) practices. When breastfeeding and nonbreastfeeding children are combined, it is clear that most children age 6-23 months are not fed according to the IYCF recommendations. Only 21 percent are fed appropriately according to all three recommended IYCF practices. The percentage of children given food from the appropriate number of food groups and the percentage fed with all three IYCF practices increase steadily with age and the wealth index and generally increase with the mother's education. Feeding practices are somewhat better in urban areas than in rural areas. Feeding practices are better among Jains and Christians than among other religious groups. Among the caste/tribe groups, feeding practices are worst among scheduled tribes and scheduled castes. Differences in feeding practices for girls and boys are minor. Differentials in infant and young child feeding practices among states are shown in Table 10.11. Adherence to appropriate IYCF practices varies widely among the states. Appropriate feeding practices are followed most often in Kerala and Sikkim, but even in these two states a large percentage of children are not fed appropriately according to all three IYCF practices. Other states with much better than average feeding practices are Goa, Manipur, Himachal Pradesh, and Delhi. Compliance with all recommended feeding practices is lowest in Andhra Pradesh and Maharashtra, where only 1 in 10 children are fed according to all three IYCF Practices.

Figure B



4.5. NUTRITION AND ANAEMIA

Anaemia is characterized by a low level of haemoglobin in the blood. Haemoglobin is necessary for transporting oxygen from the lungs to other tissues and organs of the body. Anaemia in young children is a serious concern because it can result in impaired cognitive performance, behavioural and motor development, coordination, language development, and scholastic achievement, as well as increased morbidity from infectious diseases. One of the most vulnerable groups is children age 6-23 months. Because anaemia is such a serious health problem in India, NFHS-3 undertook direct measurement of the haemoglobin levels of all children under age five years. Measurements were taken in the field using the HemoCue Hb 201+ analyzer1. This system uses a single drop of blood from a finger prick (or heel prick in the case of infants under six months old), which is drawn into a cuvette and then inserted into a portable, battery-operated instrument. In less than one minute, the haemoglobin concentration is indicated on a digital read-out. At the end of the test the parent/responsible adult was given a written record of the results for each eligible child who was tested for anaemia. In addition, the health investigator described the meaning of the results for each child and advised the parent/responsible adult if medical treatment was necessary. In cases of severe anaemia, an additional statement was read to the parent/responsible adult to determine whether or not he/she

would give permission for the research organization conducting the survey to inform a local health official about the problem. Data collected shows that 70 percent of these children are anaemic, including 26 percent who are mildly anaemic (10.0-10.9 g/dl), 40 percent who are moderately anaemic (7.0-9.9 g/dl), and 3 percent who are severely anaemic (less than 7.0 g/dl). Although there are differentials in the prevalence of anaemia by background characteristics, more than half of children in every subgroup shown in the table are anaemic. Anaemia increases slightly from age 6-8 months to age 12-17 months, and declines steadily at older ages. The prevalence of anaemia does not vary by the sex of the child. Anaemia increases with the birth order of the child, but the relationship is not strong. Anaemia is considerably higher in rural areas than in urban areas, for children of women with no education, for disadvantaged groups (particularly scheduled tribes), and for children in households in the lower wealth quintiles. The prevalence of anaemia is relatively low, but still substantial, for Jains, Christians, and Sikhs. Moreover, the survey highlights that children's anaemia status is closely linked with the anaemia status of the mother. However, even for mothers who are not anaemic, 62 percent of their children age 6-59 months are anaemic. Although state differentials in the prevalence of anaemia are marked, a high prevalence of anaemia is found in every state (Table 10.13). The only states in which less than half of children are anaemic are Goa (38 percent), Manipur (41 percent), Mizoram (44 percent), and Kerala (45 percent). The highest prevalence of anaemia is found in Bihar (78 percent), Madhya Pradesh and Uttar Pradesh (74 percent each), Haryana (72 percent), and Chhattisgarh (71 percent). Severe anaemia is most prevalent in Rajasthan and Punjab.

Chapter 5

The WHO guidelines

5.1 TREATMENT OF MALNUTRITION ACCORDING TO WHO GUIDELINES

This chapter presents the recommended cut-offs, summarizes the rationale for their adoption and advocates for their harmonized application in the identification of 6–60 month old infants and children for the management of severe acute malnutrition (SAM). It also reviews the implications on patient load, on discharge criteria and on programmme planning and monitoring. Using weight-for-height: WHO and UNICEF recommend the use of a cut-off for weight-for- height of below -3 standard deviations (SD)of the WHO standards to identify infants and children as having SAM. The commonly used cut-off is the same cut-off for both the new 2006 WHO child growth standards (WHO standards) as with the earlier National Center for Health Statistics (NCHS reference). The reasons for the choice of this cut-off are as follows:

1) Children below this cut-off have a highly elevated risk of death compared to those who are above.

2) These children have a higher weight gain when receiving a therapeutic diet compared to other diets, which results in faster recovery.

3) In a well-nourished population there are virtually no children below -3 SD (<1%).

4) There are no known risks or negative effects associated with therapeutic feeding of these children applying recommended protocols and appropriate therapeutic foods.

Using MUAC: WHO standards for mid-upper arm circumference (MUAC)-for-age show that in a well nourished population there are very few children aged 6–60 months with a MUAC less than 115 mm. Children with a MUAC less than 115 mm have a highly elevated risk of death compared to those who are above. Thus it is recommended to increase the cut-off point from 110 to 115 mm to define SAM with MUAC.

When using the WHO child growth standards to identify the severely malnourished among 6–60 month old children, the below -3SD cut-off for weight-for-height classifies two to four times as many children compared with the NCHS reference. The prevalence of SAM, i.e. numbers of children with SAM, based on weight-for- height below -3 SD of the WHO standards and those based on a MUAC cut-off of 115 mm, are very similar. The shift from

NCHS to WHO child growth standards or the adoption of the new cut-off for MUAC will therefore sharply increase case loads. This has programmatic implications.

Recommendations

Indicator	Measure	Cut-off
Severe wasting (2)[14]	Weight-for-height[15]	< -3 SD
Severe wasting (2)	MUAC	<115 mm
Severe wasting (3)	Clinical sign	

5.2. THE WHO CHILD GROWTH STANDARDS

In 2006, WHO published child growth standards for attained weight and height to replace the previously recommended 1977 NCHS/WHO child growth reference. These new standards are based on breastfed infants and appropriately fed children of different ethnic origins raised in optimal conditions and measured in a standardized way[16]. The same cohort was used to produce standards of mid-upper arm circumference (MUAC) in relation to age[17]. The new WHO growth standards confirm earlier observations that the effect of ethnic differences on the growth of infants and young children in populations is small compared with the effects of the environment. Studies have shown that there may be some ethnic differences among groups, just as there are genetic differences among individuals, but for practical purposes they

are not considered large enough to invalidate the general use of the WHO growth standards population as a standard in all populations. These new standards have been endorsed by international bodies such as the United Nations Standing Committee on Nutrition[18], the International Union of Nutritional Sciences[19] and International Pediatric

[14] 2/3 Indipendent indicators of SAM that require urgent action
[15] Based on WHO Standards (www.who.int/childgrowth/standard)
[16] When assessing weight-for-height, infants and children under 24 months of age should have their lengths measured lying down (supine). Children over 24 months of age should have their heights measured while standing. For simplicity, however, infants and children under 87 cm can be measured lying down (or supine) and those above 87 cm standing.
[17] A z-score is the number of standard deviations (SD) below or above the reference median value.
[18] UN Standing Committee on Nutrition. SCN Endorses the New WHO Growth Standards for Infants and Young Children. Available at: http:// www.who.int/childgrowth/endorsement_scn.pdf
[19] International Union of Nutrition Sciences. Statement of Endorsement of the WHO Child Growth Standards. 2006. Available at: http://www. who.int/childgrowth/endorsement_ IUNS.pdf

Association and adopted in more than 90 countries[20].

5.3 DIAGNOSING SEVERE ACUTE MALNUTRITION

In 1999, WHO defined severe malnutrition in children as a weight-for-height[1] below -3 SD[2] (based on NCHS reference) and/or the presence of oedema[21]. Experts in a meeting in 2005[22], recommended to add MUAC less than 110 mm (in 6 to 60 month old children) as an independent diagnostic criterion. Since the 2005 meeting, the WHO standards have been published and there is therefore a need to reassess diagnostic criteria including MUAC. The rationale for keeping the same cut-off for weight-for-height when defining severe acute malnutrition and for adjusting the MUAC cut-off up to 115 mm, based on the WHO standards is given below.

5.4 RISK OF DEATH AND SEVERE ACUTE MALNUTRITION

Following the release of the WHO child growth standards, the relationship between weight-for- height and the risk of dying was reassessed in existing epidemiological studies.[1] This analysis showed that children with a weight-for-height below -3 sD based on the WHO standards have a high risk of death exceeding 9-fold that of children with a weight-for-height above -1 SD (figure 1)[23]. Similar studies using MUac as diagnostic criteria showed that the risk of dying is increased below 115 mm[24]. The elevated risk of death below these cut-offs requires the implementation of intensive nutritional and medical support.

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[20] International Pediatric Association Endorsement. The New WHO Growth Standards for Infants and Young Children. 2006. Available at: http://www. who.int/childgrowth/Endorsement_IPA.pdf

[21] World Health Organization. Management of severe malnutrition: a manual for physicians and other senior health workers. Geneva, 1999. Available at: http://www.who.int/nutrition/ publications/en/manage_severe_malnutrition_ eng.pdf

[22] WHO, UNICEF, and SCN informal consultation on community-based management of severe malnutrition in children. SCN Nutrition Policy Paper No. 21. 2006. Available at: http://www.who. int/child_adolescent_health/documents/pdfs/ fnb_v27n3_suppl.pdf

[23] Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J; Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet, 2008, 371:243–60.

[24] Myatt M, Khara T, Collins S. A review of methods to detect cases of severely malnourished children in the community for their admission into community-based therapeutic care programs. Food Nutr Bull, 2006, 27(3 Suppl):S7–23

5.5 SPECIFICITY OF RECOMMENDED CUT-OFFS FOR DIAGNOSING SEVERE ACUTE MALNUTRITION

Weight-for-height below -3 sD is a highly specific criterion to identify severely acutely malnourished infants and children. Statistical theory shows that in a well-nourished population, only 0.13% of children will have a weight-for-height less than -3 SD, giving a specificity of more than 99% for this cut-off. With the release of the WHO standards for MUAC-for-age, the revision of the earlier recommended MUAC cut-off of 110 mm as an independent diagnostic criterion for severe acute malnutrition was necessary. a higher cut-off of 115 mm is recommended as it will identify more infants and children as having severe acute malnutrition and still have a high specificity of more than 99% over the age range 6–60 months.

5.6 CHILDREN BELOW -3 SD OF THE WHO CHILD GROWTH STANDARDS BENEFIT FROM THERAPEUTIC FEEDING

Currently, children with severe acute malnutrition are treated with special therapeutic foods, most commonly Ready-to-Use- Therapeutic Foods or F75 and F100 milk-based diets. Data from Malawi suggests that infants and children 6–60 months of age with a weight- for-height above -3 SD of the NCHS reference also benefit from these therapeutic diets[25]. The children who are above -3 SD of the NCHS reference but are below -3 SD of the WHO standards are most likely to benefit from therapeutic feeding.

5.7 ABSENCE OF RISK AND OF NEGATIVE CONSEQUENCES OF THERAPEUTIC FEEDING

The current treatment protocols for managing severe acute malnutrition have no known risk, and minimize negative social consequences. less stringent admission criteria for therapeutic feeding should be promoted as earlier criteria did not identify all infants and children at high risk of mortality. The below -3 SD cut-off based on the WHO growth standards for weight-for-height and the MUAC cut-off of 115 mm seem well adapted to current protocols.

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[25] Patel MP, Sandige HL, Ndekha MJ, Briend A, Ashorn P, Manary MJ. Supplemental feeding with ready-to-use therapeutic food in Malawian children at risk of malnutrition. J Health Popul Nutr, 2005, 23:351–7.

5.8 PROGRAMMATIC IMPLICATIONS OF THE ADOPTION OF THE WHO STANDARDS AND CHANGING THE MUAC CUT-OFF FOR IDENTIFICATION OF CHILDREN WITH SAM.

Using the new WHO standards in developing country situations results in a 2–4 times increase in the number of infants and children falling below -3 SD compared to using the former NCHS reference[26] To better estimate the increase in patient load resulting from the adoption of the WHO growth standards, an analysis was performed on a data base comprising 560 different nutritional surveys conducted in 31 countries (14). The data set contained anthropometric measurements for more than 450 000 children aged 6–60 months. the prevalence of saM defined by weight- for-height below -3 sD of the WHO standards and by a MUac cut-off of 115 mm were very similar: 3.22% and 3.27% respectively. When using the NCHS reference, the prevalence of severe acute malnutrition was very similar when defined using weight-for-height below -3 SD and with MUAC below 110 mm: 1.48% and 1.49%, respectively. It is important to note that using either the WHO standards or the ncHs reference, the cases selected using weight-for-height and MUac were not the same. Only about 40% selected by the one criterion were also selected by the other. Part of the explanation is that children with a low MUAC tend to be younger than those with a weight-for-height less than -3 SD. The implications of these differences in terms of associated risk and response to treatment deserves further investigation and in the meantime both should continue to be used as independent criteria for admission. Selection of patients according to the WHO standards is greatly facilitated by the use of look-up tables as shown in annex 1.

5.8.1. REDEFINING DISCHARGE CRITERIA

Previously recommended discharge criteria based on a minimum weight-for-height are not applicable to programmes using MUAC as admission criteria, as some children selected using MUAC already fulfil these weight-for- height discharge criteria on admission into the programme. This is a concern especially with large scale community-based

[26] de Onis M, Onyango AW, Borghi E, Garza, C, Yang H for the WHO Multicentre Growth Reference Study Group. Comparison of the World Health Organization (WHO) Child Growth Standards and the National Center for Health Statistics/WHO international growth reference: implications for child health programmes. Public Health Nutrition, 2006, 9:942–7.

programmes relying extensively on MUAC as the criterion for admission.

It is recommended that the discharge criterion be based on percentage weight gain. Using a discharge criterion based on percentage weight gain has the advantage of being easy to apply to children admitted based on MUAC as well to those admitted on weight-for-height. This approach has the added advantage as it eliminates the need for repeated height measurements during treatment. Children with weight-for-height above -2 and below -1 SD, have a lower mortality risk than those below -3 SD. Those with a weight-for- height above -1 SD have an even lower risk of death (figure 1). Reaching a weight-for-height above -2 or above - 1 SD can be used as a yardstick for defining discharge criteria. For children admitted at -3 SD weight-for-height defined by the WHO standards, a discharge at -2 SD and at -1 SD corresponds on average to a weight gain of 9% and 19% respectively. This percentage varies little for different lengths or heights (figure 2). for simplicity, it is possible to use 15 % weight gain as discharge criterion for all infants and children admitted to therapeutic feeding programmes (see table 2 in annex). When weight-for-height is used as an admission criterion, it is advisable to continue to discharge children at weight-for-height -1 SD. For children with oedema, the same discharge criterion should be applied using the weight after oedema has disappeared as the baseline. However, for children who have a weight-for- height above -3 SD or a MUAC above 115 mm once they are free from oedema, a discharge two weeks after the disappearance of oedema is usually sufficient to prevent relapse. The use of 15% weight gain as a discharge criterion is a general recommendation and can be adjusted up to 20% weight gain depending on the local situation. Discharge criteria can be adjusted when there are well functioning programmes that increase access to a high quality diet (supplementary feeding programmes, cash transfer, microcredit initiatives, support for improved agriculture etc.), the food security situation is good (access to nutrient dense family foods) and the number of children that can be treated by the health system is manageable. The implications of adjustment of the discharge criteria should be planned for in terms of longer lengths of stay and the resulting resource implications.

5.8.2. MONITORING THERAPEUTIC FEEDING PROGRAMMES

Using weight-for-height based on the WHO standards or MUAC less than 115 mm as admission criteria will select younger and less severely wasted beneficiaries compared to using the NCHS reference for weight-for-height or MUAC less than 110 mm. These children selected by the new criteria will have a lower risk of death, and a lower weight gain[27]. The lower case fatality rates and slower weight gains of children selected by the new standards should be taken into account when monitoring the effectiveness of therapeutic

[27] Isanaka S, Villamor E, Shepherd S, Grais RF. Assessing the impact of the introduction of the World Health Organization growth standards and weight-for-height z-score criterion on the response to treatment of severe acute malnutrition in children: secondary data analysis. Pediatrics, 2009, 123:e54–9.

Chapter 6

The Nutrimix complex

6.1. NUTRIMIX AS THE ADDITIONAL POWER FOOD

This mix is developed to provide supplementary nutrition at low cost to the malnourished children attending the Institutional Services of CINI i.e., Thursday Clinic and Out Patient Department (OPD). Apart from that various preparations of this mixture are given to malnourished children admitted at the NRC (Nutritional Rehabilitation Centre) and Emergency Ward (EW) and also distributed in outreach malnutrition intervention activities undertaken by the Institute.

Packets of Nutrimix picture

Currently a project on Nutrimix Social Business Initiative has been taken with the objective to:

- Provide sustainable local solutions for improving early childhood nutrition through low cost, locally produced, eco-friendly supplementary food, CINI Nutrimix
- Improve child feeding and caring practices at an individual and household level

- Enhance socio-economic empowerment of rural women by promoting their active participation in the manufacture and sale of CINI Nutrimix
- Generate awareness of early childhood malnutrition with active involvement of local communities in group campaigns, information dissemination, data collection and monitoring of the project
- Develop a replicable social business model for enhancing early childhood nutritional security

A 20 gm of pack is being produced by CINI to ensure the quantity per feed of the child.

6.2. NUTRITIONAL SIGNIFICANCE:

- It acts as very good supplementary food for a weaning child (when supplementary food is introduced in the child's diet from 6months onwards) because of the semi-solid consistency.
- It is a superior quality protein food, almost equal in protein content with animal protein (Combination of cereal and pulse protein complementing each other)
- It is calorie dense hence little amount can provide adequate nutrition for catch up growth.
- A high satiety value food (relieves hunger easily) for the severely malnourished children.
- Cost effective means of providing good nutrition.

From the decades of experience of CINI with nutritional significance of Nutrimix it was decided that it can act as a major change agent in upgradation of the nutritional status of the Grade III and Grade IV Malnourished children in that age group. Thus for upliftment of nutritional status of children with low nutritional status with the help of Nutrimix, CINI was roped in.

The details of Nutrimix i.e. its raw ingredients, way to prepare (Different recipes) and the nutritional significance of the premix was shared in Block level meetings. To leave a sustained impact of such initiative the SHGs were involved in the preparation and distribution of Nutrimix. This effort also helped in income generation for some of the SHGs, who prepared that.

This Nutrimix was well accepted for such intervention as a food having low production cost, high food value and easy to produce. It was also decided unanimously that this packet of Nutrimix would be distributed among the malnourished children identified, as 3rd and 4th Grade malnourished through spot growth monitoring process at the camp M-J Panchayat Samity will bear the total cost of producing the Nutrimix packets. The role of CINI was to provide the training of preparing Nutrimix to some of the SHGs selected by the Block to prepare and to sell such packets to the Panchayt Samity. The packets of Nutrimix in the name of Nutritious food were distributed among the target group

6.3. CONTENTS/ RAW INGREDIENTS:

- The mix is made up of wheat flour and green gram dal, which is again fortified with iron and iodine.
- While cooking, the oil and sugar/jaggery used will add on the existing nutritive value of the raw ingredients.

Wheat flour and green gram

6.4. NUTRITIONAL VALUES

Dall'analisi della composizione nutrizionale del preparato energetico si registrano i seguenti valori:

Nutrimix Nutrition Information				
	20g packet	100g	500g	1kg
Energy (kcal)	68	342	1709	3419
Carbohydrate (g)	13.4	66.9	334.3	668.6
Protein (g)	3.0	15.2	75.8	151.6
Fat (g)	0.31	1.57	7.86	15.71
Iron (mg)	3.14	15.72	78.62	157.23
Iodine (mg)	0.07	0.35	1.75	3.50

A single 500gm Packet contains:

Contents	Amount (gms)	Energy (Kcal)	Protein (gms)	Carbohydrate (gms)	Fat (gms)	Minerals (gms)	Iron (mg)
Wheat Flour	400	1364	48.4	277.6	6.8	10.8	19.6
Dhal	100	334	24	56.7	1.3	3.5	4.4
Total amount	500	1698	72.4	334.3	8.1	14.3	24

Each serving made from 25 grams of the mix contains:

Contents	Amount (gms)	Energy (Kcal)	Protein (gms)	Carbohydrate (gms)	Fat (gms)	Minerals (gms)	Iron (mg)
Nutrimix (5tsp)	25	84.9	3.62	16.715	0.405	0.715	1.2
Oil (2 tsp)	10	90	-	-	10	-	-

Sugar (2tsp)	10	80	-	10	-	-	-
Jaggery (2tsp)	10	95.75	0.1	23.75	0.025	-	0.66
Total Nutritive Value of each serving with (sugar)	45	254.9	3.62	27.715	10.405	0.715	1.2
Total Nutritive Value of each serving with (Jaggery)	45	270.65	3.72	40.465	10.43	0.715	1.89

Nutritional values of differrent Nutrimix packs

6.5. ADMINISTERING THE NUTRIMIX: KEY POINTS

The three keypoints that allow an effective use of Nutrimix as a supplement to normal feeding are the followings: I tre punti chiave che permettono un corretto utilizzo del nutrimix, inteso come supplemento a un'alimentazione normale, sono:

1. Quality: the combination of cereals and pulses allows to obtain a protein preparation with a complete mix of amino acid full adequate to the nutritional needs of the organism. The union of these two foods makes it possible to overcome the shortage of lysine and tryptophan (lacking in cereals but not of pulses) and methionine (lacking in pulses but not in cereals).

2. Quantity: assuming a pack of nutrimix per day according to doctors at CINI caloricamente seems appropriate from a caloric point of view in order to restore and maintain a proper nutrition.

3. Frequency: As with any good practice of proper nutrition, it is recommended to fragment baby food in 5/7 small meals per day.

6.6. ENHANCEMENT OF PROTEIN CONTENT FROM NUTRIMIX TO MEET CHANGED NUTRITION NEEDS ON YHE CHILD

Being the nutrimix a neutral food, i.e. without a particular flavour, it can be used in combination with other foods such as milk, eggs, chicken or fish to increase the proportion of protein in accordance with the desired amount required of the patient. The CINI's medical advice is to use it without adding any food in the first months of life and then mix it with milk or fish from six months onwards.

6.7. CHANGE THE AMOUNT OF NUTRIMIX ADAPT TO GROWTH AT THE CHILDREN.

Another peculiarity of nutrimix is represented by the possibility to modify its consistency. For older patients, for example, you can use this powder to bake cookies or other types of desserts which the child may like during his/her growth and consequent maturation.

2. Quantity: l'assunzione di una confezione di nutrimix al giorno secondo i medici del CINI sembra caloricamente adeguata a ripristinare e preservare un corretto stato nutrizionale.
3. Frequency: come per ogni buona pratica di corretta alimentazione è consigliato frammentare la giornata alimentare del bambino in 5/7 piccoli pasti.
4.

6.8. RECIPES WITH NUTRIMIX

Nutrimix porridge/ "Payesh": Porridge of thick consistency that can be served to the child. Put two teaspoonful of oil in a pan and heat it.

Picture of a different Nutrimix cooks

- Pour the required amount in the heated oil. [One handful of powder (50 gms approx) for children above 1 yr and 5 teaspoonful (25 gms) for children below 1 yr]
- Stir for some time till the powder becomes slight brownish in color and emits a baking odour. This shows that the powder is cooked well.
- Add two teaspoon full of sugar/jaggery for every 25 gms of the powder. Add little water and cook for 2-3 minutes till it becomes a semi solid gruel such that it is difficult to pour it from spoon. This is the correct consistency to feed the child below 1 yr.
- Be careful that too much water is not poured, as it will decrease the consistency and the calorie content.
- Fleshy fruits like banana can be mashed and added to the porridge to make it further calorie dense.

Sweet balls of Nutrimix / “Nutrimix Laddu”:

- The prepared Nutrimix porridge can be further made into a ball for little older children with adequate dentition.
- For this the porridge needs to be prepared with a little less amount of water.
- Remove it from heat when the consistency is a bit dense.
- Now add ground and roasted Puffed rice / “Muri”or Semolina.
- Make small balls out of this mix and it is ready to serve the child.

Nutrimix “Barfi”/ Sweet:

- The prepared Nutrimix porridge can be further made into different shape for little older children with adequate dentition.
- The prepared porridge can be spread out into a greased plate.
- Once the porridge is cooled then it is cut into rectangular pieces and served to the child.
- At times Nuts can also be added to increase the calorie content.

Nutrimix Pancake/ “Golaruti”:It acts as a good food particularly for children with abhorrence towards vegetables.

- Seasonal vegetables can be cut out into small pieces after adequate washing.
- The vegetables are then added to the prepared powder/premix.
- Little water is added and then made into a pasty mass.
- Salt and sugar is added according to taste.
- Ginger garlic paste can be added if available.
- The whole mixture is then stirred for 5-6 minutes for uniform mixing.
- Grease a pan with minimum oil and pour a laddle full of the mix in the pan and spread it in the form of pancake.
- When one side is done then turn the other side and heat it. It is ready to serve.

6.9 NUTRIMIX AS AN INSTRUMENT OF SOCIAL BUSINES

As CINI is a long-time philanthropy based organisation, its philanthropy oriented old timer employees were opposed to anything to do with business even Social Business. In fact, those at CNI who were associated with the earlier method of teaching mothers to prepare Nutrimix at home were opposed to ‘processed food’ and were opposed to ‘ready to eat’ form of Nutrimix. However, there is a huge demand of Nutrimix to be evaded since it contributes to avoid the death of many malnourished children.

Nevertheless, several problems ad to be faced before making the Nutrimix an instrument of social business such as:

1) Problem with machineries: It was realised that some of the machineries bought for NSB plant were not of the right type. Moreover, the companies who supplied

machineries often did not provide the promised after sell service and frequent breakdown of machineries was a major problem which affected production and marketing commitments.

2) Marketing problem: the type of effort that was required for selling Nutrimix through self-help group could not be taken mainly due to lack of manpower.

3) Compromising with the goals of social business: Goal of CNSB is to reduce malnutrition. This calls for not only sale of Nutrimix but promoting its proper use for reducing malnutrition. E.g. , Often sale of Nutrimix in bulk quantity may compromise with its proper use. Repeat sale (consumption) of Nutrimix is very important get the desired result. This did not always get the desired importance.

4) Driving force behind CINI Nutrimix Social Business (CNSB)

Motivation to serve a social cause is the driving force of a social business

5) Resource problem

Resource constraint is at the root of most of the problems faced by CNSB. CNSB is badly in the need of having professionally qualified and motivated over all in charge and supporting funding to pursue its goal.

6.9 1 THE NUTRIMIX FACTORY IN THE CINI CENTER

As already mentioned above, the Nutrimix was created and produced for the first time at the CINI centre as a supplementation to nutrition deficient in vitamins and minerals. . The production centre of the mixture is located within the structure of CINI. The preparation consists of 3 easy steps.

Step 1: The constitutive elements of the integrator, i.e. cereal and proteins are sieved in appropriate gratings so as to eliminate stones and foreign bodies.

Step 2, Cereals and pulses are mixed in a system that uses high temperatures with two machines: an electric one and a diesel one.This process softens and blends the ingredients thus allowing their processing into flour in the next step.

Step3: By using the latter machines, the blend after a period of cooling is transformed into flour and is ready to be wrapped and packaged.

Step 4: The finished product, the nutrimix itself, is packaged and wrapped ready to be distributed to women and children in CINI's programmes.

Nutrimix process production.

Chapter 7

The management of patients: A case study.

In the following chapter I intend to illustrate the management of patients who access the CINI Poilan thus defining the CINI's assistential goals of the short and the educational ones of the long period. During my stay at the center, I collected the medical records of 16 patients treated at the clinic. However, I choose to report only 7 as an example of CINI's approach. All the data identifying the socioeconomic history of the patient and family and their nutritional history were collected through a questionnaire developed by CINI's team attached at the end of the thesis (Annexes A to E). The anthropometric data relating to weight, height, arm circumference were collected using instrumentation in line with the WHO guidelines.

7.1. MANAGEMENT OF VISITS AND ADMISSIONS: SHORT-TERM GOALS.

Considering the levels of care that CINI offers, the first and primary objective is to safeguard the health of the patient attending the centre, with particular attention to the identification of cases of malnutrition. The first contact between mother and CINI's specialized operators is through the so-called "clinic on Thursday." On this day, families are gathered in a large building in which the following practices are performed:

In the case in which the mother is there with the baby (already born):

2. Patient registration and collection of identificative data, a control kit is given to mothers. It includes: case history of the patient with a 12 months percentile graph to record the anthropometric parameters of children as directed by the WHO guidelines, graphic illustration concerning the proper feeding of newborn babies and mothers, proper practices for an adequate breastfeeding and personal care.
3. Recording weight and height: The child is weighed with appropriate instruments recorded and data derived are reported on the patient's personal folder.
4. Pediatric visit: CINI has 4 pediatricians. During the visit, the pediatrician transcibes anthropometric data recorded in percentiles charts and proceeds with a general visit. Pediatricians pay extreme attention to respiratory, immunological (infections), metabolic (malnutrition) and brain (cognitive delays) deseases.

5. According to the information concerning drug therapy, the family is sent to the pharmacy that gives them the necessary medications.

The total cost of this first "package" of services is 50 RS, corresponding to about 0.76 euro cents. On the other hand, the following up appointments during which single-serves of Nutrimix are also given cost 20 RS, about 0.30 euro cents. CINI has decided to establish a fee for each service package to create a bond between the organization and family. If the family pay even a very small amount of money, the service is perceived as more valuable and professional. Moreover, as explained by CINI's organizers, the act of paying prevents supplements and medicines are wasted. Consequently, the families voluntarily come to the center and express their consent to be followed by the organization and, as reported by CINI's operators, they has become over time more aware of the treatments and care provided.

In cases of pregnant women, they start a clinical pathway specifically organized for them in which a team of gynecologists are concerned with monitoring the 'trend of pregnancy by ultrasound registration, assessment of nutritional status of the mother, education towards proper safety practices during gestation.

If the clinical evaluation highlights diseases, severe states of malnutrition or other situations of danger for the mother or the baby, the pregnant woman is hospitalized in the adjacenclinict where she will receive any necessary care. When I arrived, the most recurrent diseases, for which it was decided for hospitalization were infections of the respiratory system, malaria or dengue fever, tuberculosis, filariasis etc. All of these diseases have a common denominator represented by malnutrition especially of kwaschiorkor type. The hospitalization lasts 20 days and in addition to specific treatment nutrimix is administered as nutritional supplementation.

7.2 EDUCATION AND PROTECTION: THE LONG-TERM OBJECTIVES.

The overall objective of CINI is to improve the quality of life of its patients, and education is the means by which it seeks to achieve this goal.

For this purpose, the NGO organizes lessons on:

Home Economics,

Importance of personal hygiene as an act of prevention of many diseases,

Nutritional education dealing with breastfeeding, feeding at different stages of life and in the work place.

Training of new CINI's operators

Another tool aimed at long-term prevention is vaccination and CINI provides free vaccines to prevent major diseases present today in India.

7.3 THE ROLE OF THE DIETITIAN SPECIALIZED IN PROJECTS FOR ASSISTANCE TO HELP THE POOREST POPULATIONS.

India offers many opportunities for the dietitian to apply what she/he has learnt in theory with creativity and efficiency to reality using the scarce resources offered by the territory in the best way.

The specialized dietitian for professional qualification, is able to:

v Programme interventions for the prevention of malnutrition: he/she organizes lectures, meetings, workshops to teach mothers the correct breastfeeding practices, weaning, baby nutrition and hygiene as an act to prevent malnutrition.

v take care of the malnourished patient: he/she evaluates the clinical situation, decides and organizes nutritional rehabilitation, monitors in time the clinical and anthropometric parameters of the patient.

v Use local resources for formulation of preparations for energy and protein. The dietitian knows the properties of food and exploits their combination for the formulation of preparations with nutritional content appropriate to the specific needs of the patient.

v Actively cooperate with other operators. The specialized dietitian has the capacity to enter into a work team and builds a path of social rehabilitation by placing at the center of his/her interest the improvement oft he health of the individual and of the entire community.

Case one:

1. Name of child: Utpal Deogharia
2. Date of Birt: 23/8/2009
3. Father's name/Guardians name: Gadadhar Deogharia
4. Address: Vill+P.O.+G.P.-Anara, Block-Para
5. Occupation Father & Mother: Driver and House wife
6. Education level of Father & Mother: Class Eight Passed
7. Monthly income (approximately): Rs.2000.00
8. Case History:
   - No.of family members: 4
   - No. of siblings:2
   - Place of delivery- Home / Hospital: Hospital
   - Diet: 0-6month & 7th month onwards

Age	Type of foods	No. of feeds	Water
0-6 months	Therapeutic Feed (Lactogen)	10 times	
7th month onwards	Cerelac & Lactogen	10 times	300 ML

- Exclusive breast feeding- Yes/No: No
- Age appropriate Immunization- Yes /No: yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): Severe Pneumonia and Bipedal Odema
- Previous treatment (If any): Hospitalized from last one month for chest infection.

9. Details of malnutrition status on day of admission

Indicators	Status
Weight	3.84 kg
Length	57 cm
Z Score	<-3sd
MUAC	100 mm

10. Period of stay at NRC: 20 days
11. Medical Treatment: antibiotics/Pathological tests/micronutrients.
12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F 75	Quantity	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
22/07/12	Phase-I	9	30 ml	-	50ml	-	-	-	-
23/07/12	Phase-I	12	30 ml	-	70ml	-	-	-	-
24/07/12	Phase-I	12	30 ml	-	70ml	-	-	-	-
25/07/12	Phase-I	12	30 ml	-	60ml	-	-	-	-
26/07/12	Phase-I	10	36 ml	-	60ml	-	-	-	-
27/07/12	Phase-I	8	50 ml	-	65ml	-	-	-	-
28/07/12	Phase-I	8	50 ml	-	65ml	-	-	-	-
29/07/12	Phase-I	8	50 ml	-	65ml	-	-	-	-
30/07/12	Phase-II	-	-	8	60ml	-	-	-	-
31/07/12	Phase-II	-	-	4	65ml	4	12 gm	-	-
01/08/12	Phase-II	-	-	4	65 ml	4	12 gm	-	-

02/08/12	Phase-II	-	-	4	65 ml	4	12 gm	-	-
03/08/12	Phase-II	-	-	4	65 ml	2	12 gm	10 gm	10 gm
04/08/12	Phase-II	-	-	4	70 ml	2	15 gm	10 gm	10 gm
05/08/12	Phase-II	-	-	4	75 ml	2	15 gm	10 gm	10 gm
06/08/12	Phase-II	-	-	2	75 ml	2	15 gm	10 gm	10 gm
07/08/12	Phase-II	-	-	2	75 ml	2	15 gm	10 gm	15gm
08/08/12	Phase-II	-	-	2	75 ml	2	15 gm	10gm	15 gm
09/08/12	Phase-II	-	-	2	75 ml	2	20 gm	10 gm	15 gm
10/08/12	Phase-II	-	-	2	75 ml	2	20 gm	10 gm	10gm

1	2	3	4	5	6	7	8	9	10	11	12	13	14
3.84	3.80	3.78	3.78	3.85	3.85	3.69	3.74	3.73	3.71	3.71	3.78	3.85	3.96

11/8/12	Phase-II	-		2	75 ml	1	20 gm	10 gm	-

13.Daily weight

15	16	17	18	19	20	21	22	23	24	25	26	27	28
3.93	3.94	4	3.98	3.98	4.01	4.12							

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge

Indicators	Status
Weight	4.12kg
Length	57.5 cm
Z Score	<-3sd
MUAC	105 mm

16. No. of follow ups completed

Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	26/8/12	12/9/12	27/9/12	13/10/12
Weight	4.37	4.74	4.97	5.32
Length	58	58.5	59	60
Z Score	-3sd	<-2sd	<-1sd	<-1sd
MUAC	105	113	114	116
Status improvement / deterioration	Improve	Improve	Improve	Improve

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): No

18. Current status: No information
19. What changes were observed in behavior of mothers:

- Hand washing: Yes
- Infant Feeding: Yes
- Sanitation: No
- Drinking water: Tube well
- Mosquito net use:No information
- Immunization: Yes
- AWC Supplementary food: No information
- Growth monitoring: No

Any other: cleanness in surrounding area,

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS:
22. Home visit: Yes
23. Regular SNP with egg: No
24. Weekly weighing of child: No

Discharge

Follow up

3rd Followup

Picture of his home

Case two:

01. Name of child: Jaishree Mahato
02. Date of birth: 05/02/2012
03. Father's name/Guardians name: Natabar Mahato
04. Address; Vill+P.O.-Bhuyadih, G.P.-Dimdiha, Block-Purulia-I
05. Occupation Father & Mother: Labour & House wife
06. Education level of Father & Mother:
07. Monthly income (approximately): Rs.1500.00
08. Case History:

- No.of family members: 9

- No. of siblings: 2
- Place of delivery- Home / Hospital: Home
- Diet: 0-6month & 7th month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Exclusive Breast Milk		
7th month onwards	Semi Solid (Rice, Khichuri)	2 to 3 times	

- Exclusive breast feeding- Yes/No: Yes
- Age appropriate Immunization- Yes /No: yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): No
- Previous treatment (If any): Nothing
- Odema: No

09. Details of malnutrition status on day of admission

Indicators	Status
Weight	3.19 kg
Length	55cm
Z Score	<-4sd
MUAC	80 mm

10. Period of stay at NRC: 13 days

11. Medical Treatment: Antibiotics/ X-Ray /micronutrients.

12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
01/07/12	Phase-II	9	50ml	-	-	-	-
02/07/12	Phase-II	8	70ml	-	-	-	-
03/07/12	Phase-II	8	70ml	-	-	-	-
04/07/12	Phase-II	4	60ml	4	11gm	-	-
05/07/12	Phase-II	4	60ml	4	11gm	-	-
6/07/12	Phase-II	4	65ml	4	12gm	-	-
07/07/12	Phase-II	4	65ml	4	13gm	-	-
08/07/12	Phase-II	4	65ml	4	13gm	-	-
09/07/12	Phase-II	4	70ml	3	13gm	5 gm	5 gm
10/07/12	Phase-II	4	70ml	3	13 gm	5 gm	5 gm
11/07/12	Phase-II	4	70 ml	3	13 gm	5 gm	5 gm
12/07/12	Phase-II	4	70ml	3	15 gm	5 gm	5 gm
13/07/12	Phase-II	4	70 ml	3	15 gm	5 gm	5 gm
14/07/12	Phase-II	1	70 ml	1	15 gm	5 gm	-

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
3.19	3.21	3.32	3.48	3.47	3.52	3.52	3.59	3.62	3.70	3.69	3.77	3.76	3.77
15	16	17	18	19	20	21	22	23	24	25	26	27	28
-	-	-	-	-	-								

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children,

appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge: 14/07/12

Indicators	Status
Weight	3.77 kg
Length	57 cm
Z Score	<-3sd
MUAC	100 mm

16. No. of follow up completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	5/8/2012	20/8/2012	5/9/2012	20/9/2012
Weight	4.16	4.35	4.52	4.92
Length (cm)	57	59	60	61
Z Score	<-2sd	-3sd	-3sd	<-2sd
MUAC	110	110	115	120
Status – improvement / deterioration	Improve	Improve	Improve	Improve

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): Yes

18. Current status: 5.70kg, 125mm, 63cm, <-1sd

19. What changes were observed in behavior of mothers-

- Hand washing: Yes
- Infant Feeding: Yes

- Sanitation: No
- Drinking water: Tube well
- Mosquito net use:No information
- Immunization:Yes
- AWC Supplementary food: Yes
- Growth monitoring: Yes

Any other:

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS:
22. Home visit:Yes
23. Regular SNP with egg:Yes
34. Weekly weighing of child:Yes

Discharge

3rd Follow up

Case tree

01. Name of child: Manas Karmakar

02. Date of Birth:16/9/2009

03. Father's name/Guardians name:Hasu Karmakar, M- Jhuma Karmakar

04. Address: Karmakar Para, Bhat Bandh, Ward no.-4, Purulia Municipulity

05. Occupation Father & Mother:Labour & House wife

06. Education level of Father & Mother: Class Fifth Passed

07. Monthly income (approximately): Rs.2000.00

08. Case History:

- No.of family members: 5
- No. of siblings: 2
- Place of delivery- Home / Hospital: Hospital
- Diet: 0-6month & 7^{th} month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Exclusive Breast Milk		
7^{th} month onwards	Semi Solid (Rice, Khichuri, Biscuit)	2 to 3 times	

- Exclusive breast feeding- Yes/No: Yes
- Age appropriate Immunization- Yes /No: yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): No
- Previous treatment (If any): Nothing
- Odema:No

09. Details of malnutrition status on day of admission:15/07/2011

Indicators	Status
Weight	6.82 kg
Length	74cm
Z Score	<-4sd
MUAC	118 mm

10. Period of stay at NRC- 21 days
11. Medical Treatment: Antibiotics/ Pathological Test /micronutrients:Yes (Urine test, Hb Test, Malaria Test)
12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
15/07/11	Phase-II	4	105ml	-	-	-	-
16/07/11	Phase-II	4	110ml	4	20gm	-	-
17/07/11	Phase-II	4	110ml	4	20gm	-	-
18/07/11	Phase-II	4	110ml	4	20gm	-	-
19/07/11	Phase-II	4	110ml	4	20gm	-	-
20/07/11	Phase-II	4	110ml	4	20gm	-	-
21/07/11	Phase-II	4	110ml	4	20gm	10 gm	-
22/07/11	Phase-II	4	110ml	4	20gm	10 gm	-
23/07/11	Phase-II	4	120ml	3	25gm	10 gm	-
24/07/11	Phase-II	4	120ml	3	25 gm	20 gm	-
25/07/11	Phase-II	4	120ml	3	25 gm	20 gm	-
26/07/11	Phase-II	4	130ml	3	30 gm	20 gm	-
27/07/11	Phase-II	4	130ml	3	30	20 gm	-

					gm		
28/07/11	Phase-II	4	130ml	3	30 gm	20 gm	-
29/07/11	Phase-II	4	130ml	3	30 gm	20 gm	-
30/7/11	Phase-II	4	130ml	3	30 gm	20 gm	-
31/7/11	Phase-II	4	130ml	3	30 gm	20 gm	-
1/8/11	Phase-II	4	130ml	3	30 gm	20 gm	-
2/8/11	Phase-II	4	140ml	3	30 gm	20 gm	-
3/8/11	Phase-II	4	140ml	3	35 gm	20 gm	-
4/8/11	Phase-II	2	140ml	1	40 gm	20 gm	-

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
6.82	6.87	7	7.13	7.23	7.28	7.28	7.15	7.30	7.25	7.25	7.26	7.27	7.28
15	16	17	18	19	20	21	22	23	24	25	26	27	28
7.29	7.28	7.37	7.32	7.33	7.41	7.43							

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and

family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge: 04/08/11

Indicators	Status
Weight	7.43 kg
Length	75 cm
Z Score	<-3sd
MUAC	123 mm

16. No. of follow ups completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	20/8/2011	5/9/2011	20/9/2011	13/10/2011
Weight (kg)	7.72	7.72	7.68	7.85
Length (cm)	75	76	76	76.5
Z Score	>-3sd	<-2sd	<-2sd	<-2sd
MUAC	125	125	125	125
Status – improvement / deterioration	Same	Same	Same	Same

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): Yes

18. Current status:

19. What changes were observed in behavior of mothers-

- Hand washing: Yes
- Infant Feeding: Yes
- Sanitation: No
- Drinking water: Tube well
- Mosquito net use: No
- Immunizatio:Yes

- AWC Supplementary food: Yes
- Growth monitoring: Yes

Any other:

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS:
22. Home visit:Yes
23. Regular SNP with egg:Yes
24. Weekly weighing of child:Yes

Discharge

Case four:

01. Name of child: Shanti Deogharia
02. Date of birth: 25/8/2010
03. Father's name/Guardians name: Gadadhar Deogharia
04. Address: Vill+P.O.+G.P.-Anara, Block-Para
05. Occupation Father & Mother: Driver and House wife
06. Education level of Father & Mother: Class Eight Passed
07. Monthly income (approximately): Rs.2000.00
08. Case History:

- No.of family members: 4
- No. of siblings: 2
- Place of delivery- Home / Hospital: Hospital
- Diet: 0-6month & 7th month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Therapeutic Feed (Lactogen)	10 times	
7th month onwards	Cerelac & Lactogen	10 times	300 ML

- Exclusive breast feeding- Yes/No: No
- Age appropriate Immunization- Yes /No: yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): Severe Pneumonia and Bipedal Odema
- Previous treatment (If any): Hospitalized from last one month for chest infection

09. Details of malnutrition status on day of admission: 22/7/12

Indicators	Status
Weight	3.74 kg

Length	58 cm
Z Score	-4sd
MUAC	100 mm

10. Period of stay at NRC- 20 days

11. Medical Treatment: antibiotics/Pathological tests/micronutrient

12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F 75	Quantity	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
22/07/12	Phase-I	9	30 ml	-	-	1	15 gm	-	-
23/07/12	Phase-I	12	30 ml	-	-	-	-	-	-
24/07/12	Phase-I	3	30 ml	9	30ml	-	-	-	-
25/07/1	Phase-I	-	-	12	30ml	-	-	-	-
26/07/12	Phase-II	-	-	10	36ml	-	-	-	-
27/07/12	Phase-II	-	-	8	45ml	-	-	-	-
28/07/12	Phase-II	-	-	8	45ml	-	-	-	-
29/07/12	Phase-II	-	-	8	45ml	-	-	-	-

30/07/12	Phase-II	-	-	8	50ml	-	-	-	-
31/07/12	Phase-II	-	-	8	50 ml	-	-	-	-
01/08/12	Phase-II	-	-	4	65 ml	4	12 gm	-	-
02/08/12	Phase-II	-	-	4	65 ml	4	12 gm	-	-
03/08/12	Phase-II	-	-	4	75 ml	4	12 gm	-	-
04/08/12	Phase-II	-	-	4	75 ml	2	15 gm	5 gm	5 gm
05/08/12	Phase-II	-	-	4	75 ml	2	15 gm	5 gm	5 gm
06/08/12	Phase-II	-	-	4	75 ml	2	15 gm	10 gm	10 gm
07/08/12	Phase-II	-	-	4	75 ml	2	15 gm	10 gm	10gm
08/08/12	Phase-II	-	-	4	75 ml	2	15 gm	10gm	10 gm
09/08/12	Phase-II	-	-	2	75 ml	2	15 gm	10 gm	10 gm
10/08/12	Phase-II	-	-	4	75 ml	2	20 gm	10 gm	10gm
11/8/12	Phase-II	-		2	75 ml	1	20 gm	10 gm	-

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
3.74	3.75	3.80	3.83	3.86	3.87	3.73	3.74	3.79	3.70	3.77	3.78	3.94	4.08
15	16	17	18	19	20	21	22	23	24	25	26	27	28
3.98	4.08	4.12	4.09	4.10	4.15	4.32							

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge: 11/8/12

Indicators	Status
Weight	4.32kg
Length	68.5 cm
Z Score	<-4sd
MUAC	105 mm

16. No. of follow ups completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	26/8/12	12/9/12	27/9/12	13/10/12
Weight	4.37	4.74	4.97	5.32
Length	58	58.5	59	60
Z Score	-3sd	<-2sd	<-1sd	<-1sd
MUAC	105	113	114	116

Status – improvement / deterioration	Improve	Improve	Improve	Improve

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): No
18. Current status: No
19. What changes were observed in behavior of mothers:

- Hand washing: Yes
- Infant Feeding: Yes
- Sanitation: No
- Drinking water: Tube well
- Mosquito net use: No information
- Immunization:Yes
- AWC Supplementary food: No information
- Growth monitoring: No

Any other: Moderate cleanness in surrounding area,

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS:
22. Home visit:Yes
23. Regular SNP with egg: No
24. Weekly weighing of child: No

Discharge

Follow up

Case five

01.Name of child: Deb Gope

02.Dare of birth: 15/6/2010

03.Father's name/Guardians name: Hiru Gope, Rani gope

04.Address: Bhatbandh, Purulia Municipality

05.Occupation Father & Mother: Labour and House wife

06.Education level of Father & Mother: Illiterate

07.Monthly income (approximately): Rs.1500.00

08.Case History:

- No. of family members: 16
- No. of siblings: 4
- Place of delivery- Home / Hospital: Home
- Diet: 0-6month & 7th month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Exclusive Breast Milk		
7th month onwards	Semi Sold Food Dal, Rice, Khichuri, Egg)		

- Exclusive breast feeding- Yes/No:No
- Age appropriate Immunization- Yes /No: No
- Drinking water source / sanitation- Pond/well/tube well: Tape Water
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): No
- Previous treatment (If any): No

09.Details of malnutrition status on day of admission: 03/8/12

Indicators	Status
Weight	5.32 kg

Length	71.5cm
Z Score	<-4sd
MUAC	105 mm

10. Period of stay at NRC- 14 days
11. Medical Treatment : antibiotics/Pathological tests/micronutrients :Yes (Hb Test)
12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F 75	Quantity	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
03/8/12	Phase-II	-	-	8	80 ml	-	-	-	-
04/8/12	Phase-II	-	-	12	80 ml	-	-	-	-
05/8/12	Phase-II	-	-	4	90 ml	4	17 gm	-	-
06/8/12	Phase-II	-	-	4	100 ml	4	17 gm	-	-
07/8/12	Phase-II	-	-	4	100 ml	3	20 gm	10 gm	-
08/8/12	Phase-II	-	-	4	100 ml	3	20 gm	10 gm	-
09/8/12	Phase-II	-	-	4	100ml	3	20 gm	10 gm	
10/8/12	Phase-II	-	-	4	120ml	3	20 gm	10 gm	15 gm
11/8/12	Phase-II	-	-	4	120ml	2	25 gm	10 gm	15 gm
12/8/11	Phase-	-	-	4	120ml	2	25	10 gm	15

	II						gm		gm
13/8/11	Phase-II	-	-	4	130ml	2	25 gm	10 gm	15 gm
14/8/11	Phase-II	-	-	4	130ml	2	25 gm	10 gm	15 gm
15/8/11	Phase-II	-	-	4	130ml	2	25 gm	10 gm	15 gm
16/8/11	Phase-II	-	-	4	130ml	2	30 gm	10 gm	15 gm
17/8/11	Phase-II	-	-	4	130ml	1	30 gm	10 gm	-

•

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
5.32	5.33	5.40	5.50	5.58	5.65	5.85	6.03	5.88	5.78	6.17	6.16	6.32	6.36
15	16	17	18	19	20	21	22	23	24	25	26	27	28
6.50	-	-	-	-									

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge:17/8/12

Indicators	Status
Weight	6.50 kg
Length	72 cm
Z Score	<-3sd
MUAC	118 mm

16. No. of follow ups completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	31/8/12	16/9/12	28/9/12	13/10/12
Weight	6.65 kg	6.88 kg	6.85 kg	6.97 kg
Length	72 cm	73 cm	73 cm	73 cm
Z Score	<-3sd	<-3sd	<-3sd	<-3sd
MUAC	118 mm	120 mm	120 mm	120 mm
Status – improvement / deterioration	Improve	Same	Same	Same

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): Yes
18. Current status: No information
19. What changes were observed in behavior of mothers-

- Hand washing: Yes
- Infant Feeding: Yes
- Sanitation: No
- Drinking water: Tape Water
- Mosquito net use: No
- Immunization: Yes
- AWC Supplementary food: Yes
- Growth monitoring: Yes

- Change in behavior of AWW: Yes

Any other:

20. Enrolled child for NCCS:Yes 3
21. Home visit:Yes
22. Regular SNP with egg:Yes
23. Weekly weighing of child:No

Admission

Follow up

Case six

01. Name of child: Prasenjit Bedia
02. Date of birth: 21/9/2010
03. Father's name/Guardians name: Mihir Bedia, Nepura Bedia
04. Address: Vill-Loharsole, P.O.-Dabor Balarampur, G.P.-Pindra, Purulia-II
05. Occupation Father & Mother: Labour and House wife
06. Education level of Father & Mother: Illiterate
07. Monthly income (approximately): Rs.1600.00
08. Case History:

- No. of family members: 5
- No. of siblings: 3
- Place of delivery- Home / Hospita: home
- Diet: 0-6month & 7th month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Exclusive Breast Milk	yes	
7th month onwards	Semi Solid Food Dal, Rice, Khichuri, Egg)	Dal,rice,khichuri	

- Exclusive breast feeding- Yes/No: Yes
- Age appropriate Immunization- Yes /No: Yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): No
- Previous treatment (If any): No

09. Details of malnutrition status on day of admission: 05/8/12

Indicators	Status
Weight	4.75 kg
Length	62 cm
Z Score	<-3sd
MUAC	110 mm

10. Period of stay at NRC- 13 days
11. Medical Treatment: antibiotics/pathological test /micronutrients:Yes (Hb Test)
12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F 75	Quantity	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
5/8/12	Phase-I	9	50 ml	-	-	-	-	-	-
6/8/12	Phase-I	12	50 ml	-	-	-	-	-	-
7/8/12	Phase-I	6	50 ml	6	75ml	-	-	-	-
8/8/12	T. Phase-I	6	50 ml	6	75ml	-	-	-	-
9/8/12	T. Phase	-	-	12	70 ml	-	-	-	-
10/8/12	T. Phase	-	-	12	70 ml	-	-	-	-
11/8/12	Phase-II	-	-	4	80 ml	4	15 gm	-	-

12/8/12	Phase-II	-	-	4	80 ml	3	15 gm	5 gm	-
13/8/12	Phase-II	-	-	4	90 ml	3	15 gm	5 gm	-
14/8/12	Phase-II	-	-	4	90 ml	3	15 gm	5 gm	-
15/8/12	Phase-II	-	-	4	90 ml	2	20 gm	5 gm	5 gm
16/8/12	Phase-II	-	-	4	90 ml	2	20 gm	5 gm	5 gm
17/8/12	Phase-II	-	-	4	90 ml	1	20 gm	5 gm	-

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.75	4.70	4.80	4.79	4.98	5.17	5.20	5.30	5.28	5.30	5.35	5.47	5.59	-
15	16	17	18	19	20	21	22	23	24	25	26	27	28
-	-	-	-										

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge:17/8/12

Indicators	Status
Weight	5.59 kg
Length	63 cm
Z Score	>-3sd
MUAC	118 mm

16. No. of follow ups completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	31/8/12	16/9/12	28/9/12	13/10/12
Weight	5.65 kg	5.83 kg	5.87 kg	6.05 kg
Length	63 cm	64 cm	65 cm	66 cm
Z Score	<-2sd	<-2sd	<-2sd	<-2sd
MUAC	119 mm	125 mm	127 mm	130 mm
Status – improvement / deterioration	Improve	Improve	Improve	Improve

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): Yes
18. Current status: Improve
19. What changes were observed in behavior of mothers:
    - Hand washing: Yes
    - Infant Feeding: Yes
    - Sanitation: No
    - Drinking water: Tube well
    - Mosquito net use:No
    - Immunization:Yes
    - AWC Supplementary food: No information

- Growth monitoring: Yes

Any other:

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS:Yes
22. Home visit:Yes
23. Regular SNP with egg:Yes
24. Weekly weighing of child:Yes

Discharge

Follow up

Follow up

Case seven:

01. Name of child: Ram Bedia
02. Date of birth: 19/10/2010
03. Father's name/Guardians name: Sufal Bedia, Bisakha Bedia
04. Address: Vill-Loharsole, g.P.Dabor Balarampur, Purulia-II
05. Occupation Father & Mother: Labour and House wife
06. Education level of Father & Mother: Illiterate
07. Monthly income (approximately): Rs.1500.00
08. Case History:

- No. of family members: 9
- No. of siblings: 2
- Place of delivery- Home / Hospital: Home
- Diet: 0-6month & 7th month onwards

Age	Type of food	No. of feeds	Water
0-6 months	Exclusive Breast Milk	Yes	
7th month onwards	Semi Soli Food (Rice, Dal, Khichuri, Egg)		

- Exclusive breast feeding- Yes/No: Yes
- Age appropriate Immunization- Yes /No : Yes
- Drinking water source / sanitation- Pond/well/tube well: Tube well
- Personal hygiene of mother/family- poor/moderate/good/excellent: Moderate
- Medical complications (If any): No
- Previous treatment (If any): No

09. Details of malnutrition status on day of admission: 05/8/12

Indicators	Status
Weight	4.82 kg
Length	60 cm
Z Score	<-2sd
MUAC	114 mm

10. Period of stay at NRC: 12 days
11. Medical Treatment: antibiotics/pathological test /micronutrients: No
12. Type of Diet given during stay at NRC: Details from SAM Chart – Day wise type of food and quantity-SAM chart

Date	Phase	F 75	Quantity	F100	Quantity	T.F	Qty	Khichuri (One Time)	Suji (One time)
5/8/12	Phase-II	-	-	9	75 ml	-	-	-	-
6/8/12	Phase-II	-	-	12	75 ml	-	-	-	-
7/8/12	Phase-II	-	-	4	80 ml	4	15 gm	-	-
8/8/12	Phase-II	-	-	4	80 ml	4	15 gm	-	-
9/8/12	Phase-II	-	-	4	80 ml	4	15 gm	-	-
10/8/12	Phase-II	-	-	4	90 ml	3	15 gm	5 gm	-
11/8/12	Phase-II	-	-	4	90 ml	3	15 gm	5 gm	-
12/8/12	Phase-II	-	-	4	100 ml	3	15 gm	5 gm	-

13/8/12	Phase-II	-	-	4	100 ml	2	15 gm	5 gm	5 gm
14/8/12	Phase-I	12	55 ml	-	-	-	-	-	-
15/8/12	Phase-I	12	55 ml	-	-	-	-	-	-
16/8/12	T. Phase	-	-	12	75 ml	-	-	-	-
17/8/12	T. Phase	-	-	12	75 ml	-	-	-	-

13. Daily weight

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.82	4.86	4.90	4.99	5.02	5.07	5.10	5.17	5.21	5.16	5.13	4.99	5.03	-
15	16	17	18	19	20	21	22	23	24	25	26	27	28
	-	-	-	-	-	-	-	-	-	-	-	-	-

14. Counselling Topics: General Sanitation Hygiene, Immunisation, Nutritional care for young children, causes of malnutrition in children, care of sick children, appropriate way of cooking, how to make nutriotious food with available resources at home, Breast feeding practices, complementary feeding practices, providing sensory stimulation and emotional support throw play activities, care of mother and family planning, importance of weighing the child and growth monitoring, follow up and care at home after discharge from NRC.

15. Status of child on day of discharge:17/8/12

Indicators	Status
Weight	5.03 kg
Length	61 cm
Z Score	<-2sd
MUAC	118 mm

16. No. of follow ups completed: Details of follow up weight & length

Indicators	Follow-up-1	Follow-up-2	Follow-up-3	Follow-up-4
Date	31/8/12	16/9/12	89/12	13/10/12
Weight	4.74 kg	5.13 kg	5.27 kg	5.50 kg
Length	62 cm	62 cm	63 cm	63 cm
Z Score	<-3sd	<-2sd	<-3sd	<-2sd
MUAC	105 mm	115 mm	118 mm	125 mm
Status – improvement / deterioration	Detoriet	Improve	Improve	Improve

17. Follow up by AWW – receiving ICDS food every day (egg & Kchichuri): Yes

18. Current status: No information

19. What changes were observed in behavior of mothers:

- Hand washing: Yes
- Infant Feeding: Yes
- Sanitation: No
- Drinking water: Tape wather
- Mosquito net use: No
- Immunization:Yes
- AWC Supplementary food: Yes

- Growth monitoring: No

Any other:

20. Change in behavior of AWW: Yes
21. Enrolled child for NCCS: No
22. Home visit: Yes
23. Regular SNP with egg: Yes
24. Weekly weighing of child:Yes

Before

After

Follow up

Conclusions

I want to emphasize how much this experience has been extremely fruitful both from a professional and a personal perspective.

The CINI, as it emerges from my thesis, is a reference centre for the people who live in the East area of Kolkata. Moreover, thanks to the support and sponsorship of numerous international NGOs (non-international organizations like Save the Children, UNICEF), its initiatives and projects are now also expanding into other parts of the country outside of the West Bengali as in Jharhuand and Chattishash.

Dealing with the overall organizational aspect of the project, I believe that one of its strengths is to raise the standard of quality of the service offered to the local population. Particularly significant to this point is the fact that CINI not only involves local human resources, but also places emphasis on the educational aspect.
This project workforce is, in fact, constituted of local Indians offering thus an occupation to many people (the organization has about 2000 operators). By doing so, it manages to get closer to the local community by using the same dialectal language, understanding the culture and lives of people in need. I think that this approach is really positive and guarantees a long-term intervention through the education of the families that access the centre and attend specific lessons about nutrition, hygiene and home economics, weaning and prevention of major infectious diseases. The culture of an individual is a unique, permanent gift and stimulating and enriching it I think is the greatest tool to bring about a real change. CINI, therefore, offers a path of complete assistance both in the short and long term for mothers and their babies, giving prompt intervention in case of serious problems and also welcoming these young women by offering asylum and work.

Annex A: Recording folder of the patient.

INPATIENTS RECORD : NUTRITION REHABILITATION CENTER

Child In Need Institute (CINI)

Admission No.: ☐

Date & time of Admission : ☐☐/☐☐/☐☐☐☐ at ☐

Date & Time of Discharged : ☐☐/☐☐/☐☐☐☐ at ☐

Admission Details

Name of Patient : **Father's** Name :

Full Postal address **Village :** **P.O:**

Pin : **P.S:**

Contact No.: **Contact Person :**

Age (months):_____ **Date of birth :** ☐☐/☐☐/☐☐☐☐ **Sex:** ☐ Male ☐ Female

Birth Rank : ☐ **Date of birth of next younger sibling :** ☐☐/☐☐/☐☐☐☐

Immunization card present ? ☐ Yes ☐ No → **If No :** When will it be produced ?_____

Weight (kg):_____ **Z-SCORE** ☐ **Height / Length** (cm) :_____ **Z-SCORE :** ☐

To Be Filled In By Doctor :

Reason for admission : ☐ malnutrition ☐ malnutrition + infection / illness ☐ infection / illness only

☐ lactation failure ☐ Other - specify :_____

Has the care giver been to EW or NRC **before ?** ☐ No. ☐ Yes ☐ **If Yes:** → Was it **same child ?** ☐ No. ☐ Yes

Family Details

Pedigree Chart :

Total No. of Children

△ = Boy child alive

○ = Girl child alive

A = Abortion

SB = Still birth

▲ = Dead boy child

● = Dead girl child

Any family history of ?

Tuberculosis? ☐ No. ☐ Yes

Alcoholism? ☐ No. ☐ Yes

Parental death? ☐ No. ☐ Yes

Single mother? ☐ No. ☐ Yes

Thalassemia? ☐ No. ☐ Yes

Feeding

Duration of **exclusive breastfeeding** (in months) → Exclusively **breastfed now?** Yes ☐ No. ☐

Age (in months) at **termination** of breastfeeding : _____ / ☐ N/A - still breastfeeding

Age (in months) at introduction of any foods or fluids (incl water and formula) : _____ / ☐ N/A - still breastfeeding

Complaints

a) Fever : ☐ No. ☐ Yes

b) Cough : ☐ No. ☐ Yes **c) Breathlessness/difficulty breathing :** No. ☐ Yes

d) Nose : ☐ no complaints ☐ blocked ☐ running ☐ Other : _____

e) Vomiting : ☐ No. ☐ Yes : **f) Appetite :** ☐ Normal ☐ Hungry ☐ Poor ☐ None

g) Loose motion : ☐ No. ☐ Yes → **If Yes :** Frequency? _____ Per day → Use of ORS? ☐ No. ☐ Yes

→ **If Yes :** Bloody? ☐ No. ☐ Yes

h) Constipation : ☐ No. ☐ Yes **i) Passing Urine :** ☐ Yes. ☐ No.

j) Any other complaints? ☐ No. ☐ Yes - Specify :

Physical Examination

a) Pulse (# / min) : **b) Temperature :**

c) Heart : ☐ Normal ☐ Murmur ☐ Any other adventitious sounds : _____

d) Respiration rate (# / min) : **e) Chest Retractions :** ☐ Yes ☐ No.

f) Lungs : ☐ clear ☐ rhonchi ☐ crepitation ☐ Any other adventitious sounds: _____

g) Extremities : ☐ Normal ☐ cold ☐ Other : _____

h) Cyanosis : ☐ None ☐ central ☐ peripheral

i) Oedema : ☐ None ☐ feet ☐ legs ☐ face ☐ Others : _____ → How long ? _____

j) Lymph Nodes : ☐ None ☐ neck ☐ Other : _____

k) Ears : ☐ Normal ☐ discharge ☐ ulcers ☐ Other : _____

l) Eyes : ☐ Normal ☐ sunken ☐ discharge ☐ corneal lesions ☐ Other : _____

m) Conjunctiva : ☐ Normal ☐ pale ☐ Other : _____

n) Dehydration : ☐ None ☐ moderate ☐ severe

o) Tongue : ☐ Normal ☐ pale ☐ ulcer ☐ Other : _____

p) Skin : ☐ Normal ☐ scabies ☐ dandruff ☐ ulcers / abscesses ☐ Other : _____

q) Icterus / Jaundice : ☐ No. ☐ Yes

r) Liver : ☐ Normal ☐ tender ☐ enlarged → **Any mass ?** ☐ No. ☐ Yes

s) Abdomen : ☐ Normal ☐ hard ☐ soft → **Any mass ?** ☐ No. ☐ Yes

ANNEX B: Document for medical diagnosis.

Physical Examination - Continued

t) Anything else ? (e. g. Clubbing, Teeth, Gums, any deformity or anomaly, any vitamin deficiency...) - Specify :

Provisional Diagnosis : _____

Investigations

	Needed ?	Date done	Results
Urine	☐ No ☐ Yes		
Blood	☐ No ☐ Yes		
Stool	☐ No ☐ Yes		
Mantoux test	☐ No ☐ Yes		
x-ray Chest	☐ No ☐ Yes		

any other - specify

Final Diagnosis : _____

Medical Officer
Cini-Child in need Institute
Vill-Daulatpur, P.O.-Pailan
South 24 Parganas

Signature and stamp of the doctor : _____

আমি ..... আমার ছেলে / মেয়েকে চিকিৎসার জন্য সিনিতে ভর্ত্তি করছি। যদি তার অবস্থার অবনতি বা মৃত্যু ঘটে তার জন্য সিনি কর্ত্তৃপক্ষ দায়ী থাকবে না। প্রয়োজনে সিনি রোগীকে অন্য হাসপাতালে পাঠাতে পারেন। সিনিতে ভর্ত্তি থাকাকালীন সিনির যাবতীয় নিয়ম মানিতে বাধ্য থাকিব।

স্বাক্ষর .....

ANNEX C: Document for the registration of vaccinations received.

Immunization Status

BCG ☐

DPT 1 ☐ DPT 2 ☐ DPT 3 ☐

OPV 1 ☐ OPV 2 ☐ OPV 3 ☐

Measles ☐

DPT 1 Booster ☐ DPT 2 Booster ☐

OPV 1st Booster ☐ OPV Booster ☐

Hepatitis B (Number of does administered) 1 ☐ 2 ☐ 3 ☐

Any other vaccines.....

Congenital Anomaly (if any).....specify.....

Mental Status-Normal / Retarded / Hyperactive

Place of Delivery.....

Father's occupation (specify).....

Father's place of work.....

Mother supported child (Yes / No).....

APPENDIX D: Questionnaire for nutritional assessment.

DIETARY HISTORY

Duration of exclusive breastfeeding (in months):
Total Duration of age at which breastfeeding stopped:
Age at which non-milk feeds started:

USUAL DIET BEFORE CURRENT ILLNESS:

Type of Food or fluid given	Age at which Started (months)	Age at which stopped (months)	Amount per feed (gm or ml)
Infant formula or animal milk (specify)			
Cereals (specify)			
Other staple foods (specify)			
Water or other drinks (specify)			
Fruit/fruit juice			
Orange and dark green vegetables			
Other vegetables and pulses			
Fish, meat or eggs			
Other foods (specify)			

DIET SINCE CURRENT ILLNESS BEGAN (describe any changes):

DIET DURING PAST 24 HOURS (record all intakes):

Breakfast	
Mid- morning	
Lunch	
Evening	
Dinner	
Night	

SIGNATURE OF NUTRITION THERAPIST:

ANNEX E: The clinical diary for recording daily nutritional therapy.

Food consumption chart

Appetite Test (put tick on result) - Fail/ Moderate / Good Age -

Date	Wt. (kg)	Diet offered	Diet offered										Recommendations
			1	2	3	4	5	6	7	8	9	10	
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
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		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											

Ps. EDM -1 = energy dense milk provide 75 kcal/100ml, EDM-2 = energy dense milk provide 100 kcal/100m, R = refusal, PR = Partial refusal, 1R = 1 Extra Allowance, 1 = early morning, 2 = breakfast, 3 = lunch, 4 = after meal, 5 = evening snack, 6 = dinner, 7 = before bed, 8,9 = extra allowance if required (in case of refusal of one feed)

Date	Wt. (kg)	Diet offered	Diet offered										Recommendations
			1	2	3	4	5	6	7	8	9	10	
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											
		EDM - I / II ml / feed											
		Normal diet											

Ps. EDM -1 = energy dense milk provide 75 kcal/100ml, EDM-2 = energy dense milk provide 100 kcal/100m, R = refusal, PR = Partial refusal, 1R = 1 Extra Allowance, 1 = early morning, 2 = breakfast, 3 = lunch, 4 = after meal, 5 = evening snack, 6 = dinner, 7 = before bed, 8,9 = extra allowance if required (in case of refusal of one feed)

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Ultimately, there is nothing as important as informed public discussion and the participation of the people in pressing for changes that can protect our lives and liberties.

The public has to see itself not merely as a patient, but also as an agent of change.

The penalty of inaction and apathy can be illness & death."

Concluding remark by Amartya Sen in "Health in Development"

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